OBITUARY NOTICE

CHARLES SAMUEL MYERS, 1873–1946

As most readers of this *Journal* will already have learned with deep regret, Dr Charles Samuel Myers died at his home at Winsford, Somerset, last October, aged 73. He leaves a widow and five children.

In psychological journals (1, 2) I have paid tribute to Myers as teacher and friend. The first attempted to present him as a personality, the second to record his main achievements. After consideration, I decided to try in this third article to present Myers through his writings. It seemed not unfitting to choose some of his less well-known papers. It is easy to trace his publications, for it was typical of his head for affairs that he left a documented bibliography.

There are personalities which express themselves very differently in speech and writing respectively. I do not think Myers was one of those. Often he spoke with an appearance of hesitation; perhaps he was searching for the right phrase. The quotations which follow express a liking for exactness, respect for scientific method, readiness to criticize anything which seemed scientifically unfounded, and fairness towards those with whom he disagreed.

Of his early contributions to anthropology, I write as a mere reporter, taking a sample of the way in which he would often treat apparently arid themes from his essay 'The Taste Names of Primitive Peoples' (3). He begins by calling attention to work done upon primitive colour-vocabularies, in which a single word

> does duty for two or more colour-sensations, e.g. for black and blue or for blue and green; where brown receives no definite name; and even...where there is apparently but one specific colour-name, a word for red. A similar lack of differentiation exists...in primitive taste-vocabularies.
>
> One is naturally prone to conclude that such features of confused nomenclature imply corresponding limitations in the degree of sensory acuity or discriminability. Yet, even if it be certain that dark-skinned people are relatively less sensitive to the violet, and more sensitive to the red end of the spectrum than are more advanced communities, this difference is probably insufficient to account for the surprisingly common absence of a specific word for blue in primitive colour-vocabularies (pp. 162–3).

Myers points out that other factors may determine the differentiation of the names of sensations. The sensation may not have enough social value or interest to receive a special name, or insufficient pains may have been taken to analyse the sensory experience (as when an ordinary listener to music does not recognize overtones). He draws attention to a certain, though imperfect, correspondence of the features of taste—and of colour-nomenclature—in primitive languages, and to the consequent possibility that their true explanation will be ultimately found to have a psychological rather than a merely physiological basis.

With C. G. Seligman he tested Torres Straits islanders with sugar, salt, acid and quinine, obtaining their equivalent expression for sweet, sour, salt and bitter. They found that the literal meaning of the phrase commonly used in the Torres Straits to denote sweetness is 'tasting good'; the same phrase denotes saltness; the usual word for saltness is derived from sea water, the taste-names for salt and sour tend to be confused and there is no specific name for the bitter taste.

Myers then showed that precisely the same features were repeated in the taste-names of Indo-Germanic languages, and gives references to Sanskrit, Lithuanian, Russian, Latin and Semitic. He then sent a questionnaire to officers, missionaries, and Europeans resident abroad, asking them to test the natives with certain prescribed dilute solutions. He writes

> In few senses as in taste do we find such feeble powers of subjective analysis, or such a close relation with general emotional tone....And the most primitive taste-vocabularies...are based upon mere changes in affective tone. Substances are primarily classed according as they are tasteful or distasteful; the differences...between sour and bitter are considered less striking than their common impalatability.
>
> It seems likely that the intimate connections between sensations of taste, touch and emctional tone, to which the vocabularies of primitive peoples thus bear witness, date back to a very early period of phylo-genesis. For in the skin of fish occur beaker-shaped organs, which have the same structure as that of mammalian taste-buds and are continuous with similar end-organs within the mouth. And in children it has been shown that gustatory sensibility is spread throughout the mouth and pharynx far more widely than in adult life (pp. 175–6).

I give these quotations at length to show the scholarly care and fastidiousness, the international outlook and the psychological insight which he displayed in dealing with fundamental problems, and the absence of ethnocentrism, provincialism, or even parochialism which later afflicted our study, producing to-day one of the chief growing pains of social psychology. To Myers, as to Wolfgang Köhler, the terminological barriers between the senses, unquestioningly assumed by scientists—and Köhler implies, raised higher by Helmholtz—were never very impressive. Nor had he any rigid concepts of the plots which the physicist, physiologist and psychologist respectively 'ought' to cultivate. If a personal note may be struck here, I believe that my decisive step into psychology from the physical sciences, which I was studying happily, was largely the result of meeting this psychologist who took seriously such a confession as that the strings in the Prelude to the Third Act of *Lohengrin* made shimmering green sounds, and would regard this as a fact from which valuable psychological investigation could set out. To the end of his life, Myers had time for listening to the innumerable platitudes stated as novel truth by enthusiastic beginners. He received them invariably with tolerance and good humour.

Like so many psychologists, he loved music, but—to paraphrase Berlioz's famous jest—not because he did not know it. He possessed a good spring-board to start from; a knowledge of primitive music. His essay 'The beginnings of music' ((3), p. 177) compares the music of three primitive peoples, differing widely in race and culture: (i) the Torres Straits Islanders, (ii) the Veddas of Ceylon and (iii) the Kenyah, Rayan and Klemantan peoples of Sarawak in Borneo. Myers concludes that music depends on the following factors:

Discrimination between noises and tones; awareness of differences in loudness, pitch, duration, character and quality; awareness of absolute pitch; appreciation and use of (small) approximately equal tone-distances; appreciation and use of (larger) consonant intervals and the development of smaller intervals in relation thereto; melodic phrasing, rhythmic phrasing and musical meaning.

He makes useful observations concerning the relative independence of some of these musical 'faculties', the awareness of absolute pitch and the appreciation of tone-distances. He speculates that speech and music may both have been evolved from a mechanism designed for the vocal "expression of meaning", and contrasts them in their fully developed state, suggesting that the "individual differences in listening to music" which he described after the chapter was written (6) may account for rival hypotheses of different

writers "which variously ascribe the beginnings of music to speech or to the imitation of the sounds of nature, or which lay stress on the importance of sex or of rhythm".

Myers's wisdom, never arising out of mere conservatism, was often shown in his attitude, cautious though seldom discouraging, towards new developments in psychology. Thirty-six years ago he wrote an article, "The Pitfalls of 'Mental Tests'" (4), which in many of its aspects seems scarcely 'dated' as one reads it now. Here are a few quotations:

Folk are loath to recognise that the younger sciences—for example, economics, genetics, psychology, education—demand as much adequate preparation and study as the older before reliable work can be undertaken in their respective fields. Certainly every one thinks himself capable of discoursing and deciding about themes of psychological interest. Royal and Departmental Commissions, which do not contain among their members a single psychologist, are appointed to report on matters which are fundamentally of psychological concern. The psychologically untrained physician does not hesitate to pronounce on the psychology of insanity, nor the biologist on human and animal intelligence and instinct (p. 195).

Statistics serve, as a rule, but to establish and to give a measure of *observable* differences. Statistics cannot inform you that one community has broader noses, darker skins, more curly hair, or greater stature than another, unless that character is manifest enough to be apparent to the non-statistical eye. And if this be true as regards physical characters, it holds yet more strongly in respect of mental characters, inasmuch as they exhibit still wider individual variation within a community. For these reasons we must be chary against expecting from statistical manipulations more striking results than from the very nature of the data they are capable of yielding (p. 196).

To neglect introspection in psychological experiment is usually to court certain disaster. If we are in total ignorance of what has been going on in the mind of the subject during the experiment, it is rarely possible to argue from the objective data—from the measurements which it yields (p. 196).

Myers's medical work in World War I is described in his *Shell Shock in France, 1914–1918* (7). As a result of this, and of his experience of students, teachers and practitioners (he was a member of Caius College, Cambridge, noted for its medical men ever since Harvey's time) and his close association with W. H. R. Rivers and Henry Head, Myers had clear-cut views about medical training, expressed in "A Psychological Regard of Medical Education" (5), which is based upon the Bradshaw Lecture delivered before the Royal College of Physicians in 1933. The date is worth noting. I select paragraphs which follow on fairly well:

Two of the most obvious essentials for entry into the medical profession are at least a minimal amount of general intelligence and...the ability to employ scientific methods and to appreciate scientific evidence.

Within the medical profession the field of possible occupations is so wide that opportunities are afforded for unusual excess or defect in almost every other kind of mental ability and in almost every trait of personality. The student who is temperamentally averse from close or frequent social intercourse may gravitate towards medical research or to preventive medicine; if he excel in manipulative work, he may specialise in surgery; should his interests lie predominantly in the young, in the poor, in the workings of the mind, or in country life, he may satisfy them by engaging in corresponding medical practice. But unless he be endowed with at least the required minimum both of general intelligence and of scientific ability, no applicant for vocational guidance can be advised to enter as a medical student; high general intelligence being useless to him, if it be conjoined only with literary, musical or other special abilities, and adequate scientific ability being hardly conceivable in the absence of sufficient general intelligence (pp. 84–5).

The question naturally arises...whether during their five or six years of medical education, as year by year it becomes increasingly complicated, differently gifted medical students will not one day receive correspondingly different training, according as they are innately fitted rather for abstract thought or for practical action (p. 87).

If the prime object of 'pre-medical' scientific study and examinations had always been to teach the broad principles of natural science, selecting only such facts and details (apart from those needed to

establish and adequately to confirm those principles) as are likely to be of practical help to the average doctor in his professional career, there would not have now arisen the general complaint against the teaching of physics, chemistry and biology to the medical student. These subjects, however, are taught not by persons who have any medical training or interest, but by professed physicists, chemists and biologists (p. 89).

It seems well worth consideration whether the time has not come to recognise and to establish a definite 'medical discipline' throughout the training of the medical man (p. 90).

If the countless hours now spent in practical work in physics, chemistry and biology served a commensurate psychological and educational purpose in the case of the average and sub-average medical student, less objection could be urged against them. There can be no doubt that the value of such work could be enormously enhanced if it were more carefully directed towards training and exercising what is so essential for the successful diagnostician—the ability to select and to collect appropriate evidence and to draw accurate deductions from the available evidence. Such training, however, has tended to be relatively neglected, not so much because its importance has been underestimated, but rather because it is so much more difficult to examine the candidate in these abilities than to examine him in and to mark memorised facts (p. 93).

He cites, as defects in medical education, the inadequate selection of teachers and the increasing number of specialized subjects and specialist teachers:

From the start to the finish of his medical education, the student is taught by specialists in far too water-tight compartments—by chemists, physicists, biologists, anatomists, physiologists, pathologists, pharmacologists, gynaecologists, oculists, aurists, dermatologists, paediatrists, etc. The average medical student, it must never be forgotten, will become a general practitioner, having on the average one thousand insured persons, and often very many more, under his care. Yet from the start to the finish of his medical education, he never comes in touch with one of his own future kind (p. 98).

He emphasizes the naturally dominant interest of the average physiologist in minute physiology rather than in the physiology of the intact organism:

And so the medical student learns, from start almost to finish, to regard the living organism merely as a huge, blindly working aggregate of machinery, as if mind did not exist and as if the whole of medicine rested on a purely materialistic basis. While he is taught in the utmost detail the functions of the normal human body, he learns virtually nothing of the functions of the normal human mind (p. 112).

Medical education is... almost wholly in the possession of specialists, each with his own vested interests, each maintaining the supreme importance of a full knowledge of his subject for the medical student, and strenuously opposing any reduction in the time devoted to it (pp. 118–19).

Myers was a good critic—he was familiar with the 'Rivers-Head' distinction of 'protopathic' and 'epicritic' as levels of complexity in the living world—though I believe he was usually reluctant to accept entirely so 'visual' a scheme as that of nervous levels.

Perhaps he and McDougall were the first British psychologists to assess the value of Freud's contributions to psychology—Freud so far as I know, answered neither of them. Myers was the gentler of the two critics. In "Freudian Psychology" (3) he points out how most reactions to criticisms of Freud have been emotional; 'all or none', the natural results of the play of lower uncritical levels.

Few physicians have had the psychological training necessary to review Freud critically (p. 95).

It is not altogether excusable for Freud to despise or to ignore current psychology because of the errors of its youth (p. 95).

Unfortunately, the untrained psychologist is only too easy a prey to the prime psychological fallacy—that what he finds in his own mind he assumes to exist in the minds of all others. I suspect that Freud is too often unwittingly depicting 'the dim recesses of his own soul', within which affection so clearly conflicts with enmity, generosity with despotism, inferiority with ambition, and the volatile, volcanic temperament of the artist with the conscientiousness of the man of science (p. 95).

Characteristically, Myers regards Freud as a human being, needing in Freud's own words, "an intimate friend and a hated enemy", employing 'transference', but singularly innocent of the dangers of suggestion. While listing Freud's valuable services, he writes that if Freud had only troubled to define more adequately what he meant by wishes, by ideas, and indeed by sexuality, instinct, anxiety, love...and if only he had endeavoured to abide even for a few consecutive years by those definitions—how different would have been the result!

For Myers there was just psychology, with different ways of achieving truth in this study; and of these, experiment was one. Notable was his insistence upon the rights of introspection and the significance of individual differences.

Perhaps some of us who began the study of psychology under Myers may have absorbed so completely his interest in and evaluation of individual mental differences, that we have been shocked to realize the extent to which the attractions of the extreme nomothetic, neglecting the idiographic, approach had captured some eminent psychologists. It has been interesting to note in Myers's writings his respect for personality. I choose one of his lesser known articles: "Individual Religious Differences" ((3), p. 81).

Using 'religion' in its widest sense to include beliefs, thoughts and attitudes in regard to God and ceremonial ritual and other observances, he pointed out the psychological bases of individual religious differences; indicating how they depended upon individual mental differences in make-up or constitution. He recalls how Binet recorded that in estimating the cutaneous spatial threshold, two contrasting courses of behaviour might be noticed in different individuals. These he called 'simpliste' and 'interpretateur'; the one reporting only what he actually felt, the other regarding it as natural to interpret these signs in terms of his past experience.

The same two types have also been detected in estimations of visual acuity and in the attempt to listen to words indistinctly heard on the telephone or from the gramophone.

Binet found similar differences in the 'scientific' and the 'imaginative' attitudes in his two daughters. Myers remarks that this psychological difference between those who read extensive meaning into a presentation and those who will only record blunt facts must play an important part in religious differences. The one type will be concerned largely with the spirit, the other strictly with the letter, of religion.

From such extremes one passes to the consideration of the extravert and introvert: Jung has pointed out in *Psychological Types* (8) the part which these attitudes play in religious differences. (Myers did not ignore the existence of every gradation between these, as indeed between all other extremes, and the variations at different times even in one and the same individual.) He applied similar reasoning to the more intellectual (reasonable) and the more emotional (intuitive) types. The one type seeks or demands rational proofs of God, the other is fully satisfied with its intuitive certainty of God. So, again, the perseverative type and the non-perseverator may be related closely to the conservative and the radical attitude towards religion. One fears or hates change and progress, the other welcomes and delights in it. In certain individuals the tender instinct may cause a religious attitude which centres round a longing to exercise or to receive protection, or the submissive tendency may result in a feeling of inferiority. Thus are aroused antagonistic attitudes towards God; love on the one side, fear on the other.

I have not written here of Myers's best-known publications, the *Textbook of Experimental Psychology* (9), later revised in collaboration with F. C. Bartlett, or his *Introduction*

to Experimental Psychology (10); for professional psychologists who read this will already know them. Others will find in them the unerring touch of an eclectic, liberal psychologist whose death marks the end of an era.

T. H. PEAR

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Editorial Note: The first volume of this *Journal* was published in 1904, and for five years the editorial duties were shared by Professor James Ward and Dr W. H. R. Rivers. In 1913 the editorial board was reconstituted and Dr C. S. Myers became the editor proper. This position he retained until his increasing preoccupations in other directions, after the first World War, made it impossible for him to continue, and I took over from him. But his interests in the *Journal* were far from exhausted, and the success which it achieved was still due largely to his wise and willing advice. Every member of the British Psychological Society must be well and gladly aware that Myers's remarkable judgement, exercised with unfailing friendliness, set the reputation of their *Journal* in a high place among the periodical literature of psychological science. In this, as in a number of other directions, psychology in Britain owes to none more than it owes to C. S. Myers.

REMEMBERING: SOME EFFECTS OF LANGUAGE AND OTHER FACTORS

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I. *Introduction* (pp. 7–8). II. *Material* (pp. 8–9). III. *Administration* (p. 9). IV. *Marking of results* (pp. 9–10). V. *Amount of old material retained* (pp. 10–12). VI. *Topical sections omitted* (p. 12). VII. *Amount of importation* (p. 12). VIII. *Types of importation* (pp. 12–14). IX. *Transposition of material* (pp. 14–16). X. *Cultural differences* (p. 16). XI. *Social attitudes* (pp. 16–18). XII. *Summary* (p. 18). *References* (p. 19).

I. Introduction

This paper presents the results of a study of Remembering, conducted with Indian students in an Indian college.

Bartlett (1) reported some results obtained from Indian students in an experiment on serial reproduction, and noted that, although the sample was too small to allow for anything more than tentative conclusions, they seemed to show "a very distinctly stronger tendency in the direction of elaboration" (p. 140). Bartlett's comparison of Indian with English students failed to take account of the fact that the former were doing the test in an acquired language, while the latter were using their native language. How far can the differences he noted be attributed to the use of an acquired rather than a native language?

The setting of this study has certain advantages:

(i) The students were all taking instruction, reading texts, and writing examinations, through the medium of an acquired language, English. At the time of this investigation, they had been studying English for from 5 to 8 years, and had been taking most of their instruction through the medium of the acquired language for from 2 to 4 years. They had, therefore, a sufficient command of English to make possible useful comparisons between the effects of working through an acquired language, and those of working through their native language.

(ii) Students from the first and the third years of college were used. As the latter had two more years of English education than had the former, it was possible to estimate how the effects of language differences tended to alter as familiarity with the acquired language increased.

(iii) The students were drawn from several distinct communities, chiefly Hindu, Jain, Christian and Muslim (only one Parsi student took the test). These differ from each other considerably in their religious and social traditions. But all the students took the same education, an education based on Western models and foreign to the traditions of all the groups. Differences between the groups can therefore be attributed with some assurance to cultural influences persisting in spite of the modifying influence of a common education.

(iv) The students came from a society showing rapid and extensive changes, and characterized by many areas of conflict and tension. If students from a less stable group give more modifications and importations than do those from a more stable group (5), this social instability and tension might be expected to influence the process of recall. Further, it might be expected to increase the effect on recall of affective elements ((1), pp. 53–5),

and of opinions held with greater conviction (12, 3, 16) because formed under stress of conflicts in which the students participated.

II. Material

In this investigation the method of repeated reproduction of meaningful verbal material was used.

The students were given a story belonging in a cultural and social setting familiar to them all, and dealing with the following three problems of immediate social importance.

(i) *The relation of Brahmin and Outcaste in Hindu society.* Indian students have for years championed reform in the orthodox Hindu caste system, and opposed the traditional treatment of outcastes by Brahmins.

(ii) *Temple entry for Untouchables.* In the years during which this investigation took place, and preceding it, Indian students were greatly concerned over the agitation to have Hindu temples thrown open to outcastes.

(iii) *The strong nationalist feeling, and the antagonism towards British rule.* Coupled with this is the resentment towards British controlled police on account of their frequent suppression of nationalist demonstrations.

The story was composed so as to include both descriptive and narrative material. The descriptive material further included both description of a human being and of non-human material (weather). These were all arranged so as to form fairly distinct groups of material, having a recognizable sequence. In one small section (called I. Outcaste) there was some mixture of different types of material. The story, with the arrangement of parts indicated, is given herewith. In the test situation it was given as a single continuous whole, without any paragraphing or other external indication of differences within the story.

Descriptive	I. Weather	One evening at the close of the rainy season.
	I. Outcaste	A poor untouchable man stood before the brightly coloured entrance of a Hindu temple.
	II. Weather	The sky was covered with dark clouds. There was a thin mist everywhere, through which shone faintly a single ray of light from the west. There was mud over the road, and every little depression was filled with water in which were reflected the lights of nearby houses. Everything seemed wet and gloomy.
	II. Outcaste	The man was short and thin, and clad in torn shirt and trousers. His face showed both hopelessness and some signs of intelligence. His wet clothes were clinging to his body, and he was shivering in the cold.
Narrative	Brahmin	As he was gazing into the temple, a stout orthodox Brahmin came out through the doorway, and, putting on his shoes, started to descend the steps of the temple. Apparently he was an important man, as other people moved out of his way, or salaamed him respectfully. As he stepped onto the road, his foot slipped in the mud, and, being unable to control himself, he lurched against the untouchable man. Contact with an untouchable is defiling to an orthodox Brahmin, so when he realized what had happened, the Brahmin became violently angry. "Dog of an outcaste," he shouted, "why did you get in my way?" Shouting abuse, he picked up a stick off the ground, and started to beat the poor man on the back. His shouts of abuse rapidly brought other people, who came running to the spot.
	Police	Among them was a British Police Inspector. He seized the angry Brahmin, and with one blow knocked the stick out of his hand. "Stop beating that man," he ordered. He sent the Brahmin away with a severe reprimand, and took the outcaste to a hospital to have his wounds bandaged. The crowd dispersed.
Descriptive	III. Weather	Once more the quiet street was empty. The mist still hung in the air, and the lights from the temple door were again reflected in the little pools of the muddy road.

Considerable time was devoted to the preparation of the story in equivalent forms in both the acquired and the native languages.[1] Grammatical differences made it impossible for the story in one language to be a literal translation of the story in the other. But every effort was made to have the two versions equivalent in the sense that:

(i) The order of sentences, and, where grammatical differences permitted, the order of phrases, should be the same in the two versions.

(ii) Where unfamiliar or difficult words were used in one language, similar unfamiliar and difficult words should be used in the other, and where common words were used in one, similar common words should be used in the other.

(iii) The words used in one language should have emotional associations similar to those used in the other.

(iv) Where a word used in one language had several synonyms, the word used to translate it in the other language should be one also having several synonyms.

(v) The literary quality of the passage should be similar in both languages.

III. ADMINISTRATION

The story was given to first- and third-year college students to read about 2 months after the opening of college, when first-year students had had time to adjust themselves to the conditions of college life. The students were asked to retell the story, as accurately as possible, three times: 5 days later, 5 weeks later, and 5 months later. No special significance attaches to these intervals. They were the times which fitted best into the college calendar.

When the story was first given to the students to read, special care was taken to ensure that they all had equal chances to grasp the meaning of the passage, as differences in speed of reading in the native and in the acquired languages, and differences in habits of reading (for instance, perception of distinct words to the detriment of connected meanings) might introduce inequalities in the original comprehension of the material, and so affect subsequent reproduction.

The plan followed was to give each student a printed copy of the story, and ask him to read it through once just as he would read a short story in a magazine, then turn the paper face down as soon as he was finished. Then he was asked to read it again a second time, paying careful attention to details, and again turn it face down as soon as he had finished. He was then asked to read it a third time, noting the meaning carefully so that he could answer a few questions about the story if I should ask them immediately after he had finished. In this way: (i) each student had time to read it carefully at his own normal rate of reading, without having extra time to review while others were completing their reading; (ii) any slower reading speed in the acquired language was allowed for; (iii) the probable effects of different kinds of attention with which the subjects read the passage in the two languages were minimized; (iv) the students were encouraged to pay close attention to the passage without their subsequent recalls being influenced by the knowledge that they would be asked to reproduce the story at a later date (2).

Students were selected on a random basis for the groups using acquired and native languages. They were divided into three groups, on the basis of their social status, i.e. Brahmin, non-Brahmin Hindu, and non-Hindu.

IV. MARKING OF RESULTS

The results were studied with a view to four features of the remembering process: (1) amount of original material retained, (2) amount of importation, (3) kinds of importation ((1), p. 57) and the frequency of their occurrence, (4) kinds of transference and the frequency of their occurrence.

[1] I am specially grateful to Mr N. W. Abraham, M.A., Mr G. S. Dusane, M.A., and Mr B. J. Onkar, B.A., for helping me in this part of the investigation, and in the marking of the results.

The results were also studied to determine the differences between the following groups in amount of recall and in the nature of the reconstructive process: (1) first- and third-year students, (2) native and acquired language groups, (3) the three social groups, (4) the three trials, (5) the different groups of topical material incorporated in the story.

The results were analysed by Fisher's (4) method of the Analysis of Variance. This made possible the discovery of significant interactions between the various groups, and the isolation of psychologically significant relationships underlying them (10).

In order to determine the amount of original material remembered, and the amount of new material added, a list was made of 140 important words found in the story.

Since the topics within the story were of very unequal length, each student's raw score on a given topic was reduced to a percentage of the words belonging in that topic for purposes of calculation. Weather sections I and II were always taken together.

V. Amount of old material retained

Table 1 gives the significant group differences and interactions obtained when the various groups are compared in terms of the amount of original material remembered, calculated as the number of words, from the selected list of 140, which reappear in the students' recalls, either in their original form or as synonyms.

Table 1

	Difference	s.s.	Mean square	*F**	0·05	0·01
Group differences						
Native *v.* acquired language	1	0·2806	0·2806	11·41	3·85	6·66
First year *v.* third year	1	0·1188	0·1188	4·83	3·85	6·66
Between social groups	2	0·1269	—	—	—	—
Between recalls	2	0·7852	0·3926	15·96	3·00	4·63
Between topical sections	5	16·1686	3·2337	131·45	2·22	3·04
Descriptive *v.* narrative	1	0·2832	0·2832	11·51	3·85	6·66
Descriptive (minus I. Outcaste) *v.* Narrative	1	2·7238	2·7238	130·33	3·85	6·66
Interactions						
Between years × between languages	1	0·2451	0·2451	9·96	3·85	6·66
Between years × between topics	5	0·3600	0·0720	2·93	2·22	3·40
Between years × between social groups	2	0·1999	0·1000	4·07	3·00	4·63
Between languages × between topics	5	0·6761	0·1352	5·50	2·22	3·40
Between languages × between social groups	2	0·2408	0·1204	4·89	3·00	4·63
Error	1224	30·1416	0·0246	—	—	—
	1020	21·3029	0·0209	—	—	—

* Using tables given in (9).

Certain conclusions can be drawn from this table, and the other figures on which it is based.

(1) Students working through the medium of their native language remember a significantly greater amount of original material than do students working through the medium of the acquired language. There is, however, a significant difference between the first and the third years in this particular. The difference between the two language groups is very significant for the first year, but has virtually disappeared by the time the students reach the third year. This is because the third-year students have improved their standard of performance in the acquired language, and not because of any decrease in their standard of performance in the native language, as indicated in Table 2.

The effect of the language factor also differs significantly from one social group to another, the non-Brahmin Hindus showing the greatest difference between the two language groups, and the Brahmins showing practically no difference. The language factor is also irregular in its effects over the various groups of topical material in the story. In all topical sections except the short Outcaste I section the use of the native language produces higher scores, but in this section the opposite is true. The reason for this is not clear from the nature of the test material, but it may possibly be due to some failure to obtain linguistic equivalence, as described above, for this section. The relative influence of the language used is not affected by the passage of time, as indicated by the different recalls.

Table 2

	Mean values	
	Native language	Acquired language
First year	26·7	21·9
Third year	26·3	26·4

(2) The difference between the amount of material remembered by the first- and the third-year students is only moderately significant, the advantage being with the third year. This is due largely to the fact of the acquired language having ceased to be a handicap in the third year (Table 2), rather than to any more general difference in remembering ability between the years. This difference between the years, however, shows a fairly significant irregularity from one type of topical material to another. The third-year students remember descriptive material better than do the first-year students, but the first-year students remember narrative material better than do the third-year students. This appears to be an educational influence independent of the language used. It merits further investigation to determine its cause. The difference in years also occurs irregularly in relation to social groups, the Brahmin and non-Hindu groups scoring higher in the third year than in the first, the non-Brahmin Hindu group scoring higher in the first year than in the third year.

(3) Differences between the social groups in total amount of material remembered are quite insignificant.

(4) Differences between trials, showing the effect of the passage of time on remembering, are highly significant, the amount remembered decreasing steadily with the passage of time. This occurs regularly for both languages, both years, all social groups, and all topics.

(5) Differences in the topical nature of the material influence remembering to a far greater extent than do all the other factors studied. This is primarily reducible to a difference between descriptive and narrative material, the narrative being remembered better. If the short Outcaste I section (in which there is some mixture of material) is omitted, almost the entire difference between topics can be attributed to this difference between descriptive and narrative material. As mentioned above, this difference varies from the first to the third years, the difference in the recall value of descriptive and narrative material decreasing with the progress of education. There is also evidence that the difference in topical material operates irregularly for the two language groups. Detailed examination, however, indicates that most of this is due to the Outcaste I section, mentioned above. If this section is omitted, the significant interaction disappears. It would appear, therefore, that the apparent irregularity is due to some undetermined feature of a single small section, and that otherwise differences in the nature of the topical

material affect remembering in similar ways for both language groups. They also operate in similar ways for all social groups.

VI. Topical sections omitted

A number of students left out whole sections. These came exclusively from the descriptive material, and in the great majority of instances it was the Weather III section that was left out. This is presumably due both to the fact that it occurs at the end of the story, and to the fact that it virtually repeats, in a slightly different form, material given earlier. Although Bartlett (1) found the position of the material to be unimportant, this suggests that position, in conjunction with another factor such as repetition, may have a considerable influence on remembering.

VII. Amount of importation

When the different groups are compared in terms of the total amount of importation, the only difference that is significant on the 0·01 level is that between language groups. Students working in the acquired language tend to import a significantly greater amount of material than do students working in their native language. This is more true of third-year students than of first-year students, the interaction of years by languages being significant on the 0·05 level,[1] although differences between years are themselves quite insignificant. The differences between social groups are significant on the 0·05 level, the non-Brahmin students tending to add the most material, and the non-Hindu students the least. Differences between trials, showing the effect of lapse of time, are entirely insignificant. This does not seem to agree with Bartlett's (1) conclusion that the importation of new material tends to increase with the lapse of time. Under conditions of this investigation, the original 5-day interval seems to have been sufficient to allow the major additions to appear. It is also possible that there is here a group difference between English and Indian students, the latter introducing addition and elaboration ((1), p. 145) at an earlier stage than the former.

VIII. Types of importation

In order to determine the types of importation which occurred most frequently, some 270 variations introduced into the original text were tabulated, and the frequency of their occurrence noted in percentages for each of the various groups and subgroups. These were then classified into the following six groups:

(i) Making explicit points already implicit in the narrative, e.g. the statement "it had rained", which is implied by what is said in the story, but is nowhere explicitly stated.

(ii) Over-emphasizing points already mentioned in the original story, e.g. "it was *very* wet"; "he picked up a *club*".

(iii) Under-emphasis of points mentioned in the original story, e.g. he only "threatened" to beat the outcaste.

(iv) Addition of material contrary to that given in the original story, e.g. "one morning"; "the Brahmin was knocked down by the outcaste".

(v) Additions not contrary to what is given in the original story, e.g. "the Brahmin, having finished worship"; "the west door of the temple".

[1] It is interesting to compare this with the results of a previous study (11) in which third- and fourth-year students in an Indian college were found to do better in a sentence construction test when working in the acquired language than in their native language.

(vi) Addition of words tending to enhance the dramatic value of the action, e.g. "at that moment"; "came immediately".

Each of these groups was further subdivided, and the frequency of their occurrence calculated separately for each type of topical material: Weather, Outcaste, Brahmin and Police. Table 3 gives the group differences and interactions which are significant or approach significance.

Table 3

	Differences	s.s.	Mean square	F	0·05	0·01
Group Differences						
Brahmin and non-Brahmin *v.* non-Hindu	1	0·4263	0·4263	4·5	3·85	6·66
Between types of importation	5	13·8738	2·7748	29·5	2·22	3·04
Interactions						
Between languages × types of importation	5	3·8898	0·7780	8·3	2·22	3·04
Between topical groups × types of importation	15	17·7714	1·1848	12·6	1·76	2·20
Error	1224	115·2356	0·0941	—	—	—

When all Hindu students are taken together and compared with non-Hindu students the difference becomes significant, Hindu students tending to introduce more importations than do non-Hindu students, for all three recalls, irrespective of degree of education, language, or the nature of the material. There is no other significant difference between years, between languages, between trials, or between topical groups of material.

The differences between the various types of importation themselves constitute by far the most significant influence determining the frequency with which each will occur. The most common tendency is to introduce words and phrases emphasizing the dramatic movement of the story, with the tendency to over-emphasize points in the story coming next in importance. Considerably less frequent, and grouped closely together, are the tendencies to make explicit what was implicit, to add points contrary to the original, and to add points not contrary to the original. This apparent similarity between the addition of material contrary to the original, and of material not contrary to the original, in fact masks a considerable difference in the frequency with which these two types of importation occur from one type of topical material to another (Table 4). The tendency to under-emphasize the given material occurs very infrequently. These relations are shown in the last column of Table 3.

Table 4

	Mean values				
	Weather	Outcaste	Brahmin	Police	Total
Making explicit	2·63	0·87	1·03	1·13	5·66
Over-emphasis	2·11	1·40	5·87	0·61	9·99
Under-emphasis	0·36	0·00	0·25	0·49	1·10
Additions contrary	1·29	1·31	1·32	1·34	5·26
Additions not contrary	0·91	1·02	3·04	0·89	5·86
Dramatic effect	1·33	1·17	2·17	6·14	10·81

The effects of the various types of importation are very irregular in their operation. They are not influenced by differences in degree of education (first *v.* third years), nor by the passage of time as indicated by the different recalls, nor by social status. But they are strongly influenced by the topical nature of the material into which the importation is introduced.

The descriptive sections appear, on the whole, to have less differential influence in facilitating some types of importation, and inhibiting others, than do the narrative

sections. Of the two descriptive sections, the weather section facilitates particularly the tendency to make explicit what was implicit.

While the narrative sections differ from the descriptive in their greater tendency to exaggerate some types of importation as compared with others, they differ from each other in the types which they respectively exaggerate and diminish. The Police section tends to facilitate the importation of dramatic material to a much greater extent than does any other section. This consists chiefly of phrases emphasizing the quickness with which the police inspector comes to the help of the outcaste. As contrasted with the Police section, the Brahmin section tends to facilitate chiefly the importation of material designed to over-emphasize given items, and the importation of new items not contrary to the original. Narrative material thus seems to increase variability in the process of importation, while the particular kind of importation which it facilitates or inhibits seems to be determined by something in addition to the narrative character of the passage. In this story, it appears to be determined by the extent to which the passage does or does not express attitudes which the reader finds satisfactory (see § XI).

The effects of the various types of importation are further modified by the language used, as shown in Table 5.

Table 5

	Native language	Acquired language
Making explicit	3·37	2·28
Over-emphasis	4·60	5·39
Under-emphasis	0·81	0·29
Additions contrary	2·37	2·89
Additions not contrary	3·01	2·85
Dramatic effect	8·23	2·58

Students working through their own language tend to make importations heightening the dramatic effect of the story to a much greater extent than do students working through the acquired language.

IX. Transposition of material

Transposition of material occurs, in this investigation, in three main ways: (i) there may be the transposition of some entire section (e.g. Outcaste I, Weather II) to a new position in the story; (ii) there may be transposition of details within a given section; (iii) there may be transposition of detail from one section to another section. Table 6 shows the differences in the frequencies with which these occur, and the differences in the frequency with which transposition in general occurs for the various groups studied.

The third-year students give significantly more transpositions of all types than do the first-year students. Increase of education, therefore, at this stage and with this group, does not appear to decrease, but rather to increase this type of error. The use of the native language tends to produce a great many more transpositions than does the use of the acquired language. Transposition of detail within a section occurs with much greater frequency than do either transposition of whole sections or transposition of details from one section to another.

These differences, however, as the interactions show, do not occur regularly from group to group. The increase in amount of transposition shown by the third year, for instance, is almost entirely in transposition of material within groups. In the other two types of

transposition there is very little difference between the first and third years, as shown in Table 7.

Table 6

	Difference	s.s.	Mean square	*F*	0·05	0·01
Group differences						
Between years	1	1·8591	1·8591	7·93	3·94	6·90
Between languages	1	7·6440	7·6440	32·68	3·94	6·90
Between types of transposition	2	23·6197	11·8099	50·36	3·09	4·82
Transposition (types i and iii) *v.* transposition (type ii)	1	23·4366	23·4366	99·94	3·94	6·90
Total s.s. for interactions	99	23·2153	0·2345	—	—	—
*Interactions**						
Between years × between types of transposition	2	1·9626	0·9813	4·48	3·09	4·82
Between years × [transposition (i and iii) *v.* transposition (ii)]	1	1·6000	1·6000	7·26	3·94	6·90
Between languages × between trials	2	2·0160	1·0080	4·61	3·09	4·82
Between languages × between types of transposition	2	3·8925	1·9463	9·77	3·09	4·82
Between languages × [transposition (i and iii) *v.* transposition (ii)]	1	2·3438	2·3438	11·00	3·94	6·90

* Each of these interactions is calculated against the remaining total for interactions after its own s.s. and difference have been deducted.

Table 7

	Mean values for types of transposition		
	Entire section	Within section	Between sections
First year	16·35	29·12	15·61
Third year	15·42	40·04	19·79

The difference in the frequency with which transpositions occur in the two language groups increases with the passage of time (Table 8). Five days after the story is read, transpositions occur with slightly greater frequency in the native than in the acquired language; five months after it has been read, they occur with almost double the frequency in the native as in the acquired language. Moreover, in the native language the frequency of transpositions increases with the passage of time, while in the acquired language it decreases.

Table 8

	Mean values		
	Trial I	Trial II	Trial III
Native language	24·96	26·90	30·69
Acquired language	21·75	16·52	15·51

The difference between language groups also affects the frequency with which the various types of transposition occur (Table 9). The use of the native language tends to increase the frequency primarily when it is transposition of details within a section.

Table 9

	Mean values for types of transposition		
	Entire section	Within section	Between sections
Native language	16·93	43·89	21·73
Acquired language	14·84	25·27	13·67

X. Cultural differences

How far are these results characteristic only of Indian students in an Indian cultural setting, and how far are they true for other people also? To put the question in another way, how far are they attributable to varying cultural influences, and how far are they native to the mind?

This investigation clearly gives little definite information on which to base an answer. Such information can only be obtained when similar investigations are made with various other cultural groups, and the results compared. It is the writer's personal opinion, based on observations of Indian students over a period of several years, that many of the results obtained in this study are primarily due to cultural influences. Differences between effects of acquired and native language groups may also be due in part to the *type* of training given to Indian students in the earlier stages of education, when the native language only is used. This needs to be verified by further investigation.

XI. Social attitudes

The nature of the changes taking place in recall is influenced by social attitudes (1, 2, 3, 16). Bartlett (1) has pointed out that the study of such recall processes often reveals social attitudes different from those expected.

It would be well, therefore, to state how, when the story was prepared, social attitudes were expected to modify recall.

(i) *Weather sections.* It was expected that the rather specific statements in the story would be changed into general statements coloured by emotional moods.

(ii) *The temple.* It was expected that, on account of the recent agitation about temple entry for untouchables, the temple and the outcaste would become much more closely connected in recall than in the original story, with the outcaste possibly attempting to enter the temple.

(iii) *The outcaste.* On account of the way in which students had championed reform in the treatment of outcastes, demanding that they should have a greater measure of equality with other men, it was felt that they would in recall improve the character and appearance of the outcaste. The word 'intelligent' was deliberately introduced into his description to see if the students would seize on it and use it as a basis for this improvement in their conception of his character.

(iv) *The Brahmin.* On account of the tendency among Indian students to condemn both the caste system itself and the domineering attitude of Brahmins towards outcastes, it was felt that they would, in recall, exaggerate his cruelty and introduce features derogatory to his character.

(v) *The police inspector.* On account of the widely felt antagonism among students to British rule, and their frequent resentment against police action, it was felt that either of two things would happen: either (*a*) the official would be made Indian, rather than English, perhaps with his designation changed from a policeman to something else; or (*b*) he would remain an English police inspector, but his behaviour would be altered so that the helpful actions recorded in the story would be changed into actions that were unpleasant, domineering, or in some way discreditable.

In fact, the main changes introduced during recall were of the following types:

(i) *Weather sections.* There were practically no generalized statements, coloured by

emotional moods. Recall was in terms of specific details, even when these differed considerably from the original.

(ii) *The temple.* Modifications connected with the temple were of several types: (*a*) there was a general tendency to give the temple a position of more central importance than it had in the original. (*b*) Almost all recalls exaggerated the brightness of the temple, and many tended to concentrate all the lights of the neighbourhood in it. (*c*) There was a very general tendency to speak of worship going on in the temple. (*d*) Only a very few spoke of the outcaste as trying to enter the temple, or as being punished for coming too close to it.

(iii) *The outcaste.* Almost all students emphasized the pitiable condition of the outcaste—his weakness, poverty, virtual nakedness, thinness, and even stupidity and ugliness. Almost without exception they forgot the adjective 'intelligent'. To generalize, one might say that their picture was one of exaggerated compassion without respect.

(iv) *The Brahmin.* Modifications were of several types, of which the following are the most important: (*a*) almost all students exaggerated the severity of the beating given by the Brahmin to the outcaste. (*b*) The great majority attributed the anger of the Brahmin merely to the fact that the man he touched was an outcaste, without any reference to religious defilement at all, thus tending to base the quarrel rather on social differences than on religious principles. (*c*) Almost all exaggerated his stumble into an actual fall, a few adding that he became dirty. (*d*) There was, however, virtually no tendency to make statements detrimental to the character of the Brahmin. (*e*) A large number of students exaggerated the importance of the Brahmin as suggested in the story, and altered it to make him very clever, well-educated, intelligent, or even virtuous and spiritual. To generalize, one might say that their attitude showed strong condemnation of the Brahmin's action coupled with a measure of respect for his person—or, at least, strong condemnation without contempt.

(v) *The police inspector.* Modifications of special interest here are as follows: (*a*) the description of the police inspector as English or British is almost universally retained. Only two students make him an Indian. (*b*) In the story he appears rather casually on the scene, as merely one of the crowd. One of the commonest practices of the students was to introduce phrases attributing to him a great deal more initiative and decision in coming to the help of the outcaste. (*c*) Another very common type of modification emphasizes the kindness shown by the police officer, e.g. he lifts the outcaste in his arms, he takes him to the hospital in his car, he nurses him, etc. Some students add the explicit statement that he was a kindly man, that he was moved with pity, or that he was a very just man and could not tolerate the injustice of the Brahmin. In view of the way in which this section of the story was designed to appeal to the well-known anti-British sentiments of most Indian college students—forcibly demonstrated in the 'Quit India' movement of August and September, 1942—these results are rather striking. They remind one of the statement frequently made to the author by educated Indians, that they are opposed to the English, but that they like individual Englishmen.

To try and sum up, one might say that two outstanding effects of social attitudes on recall are these: (*a*) knowledge of the traditional functions of the temple in Hindu community life tends to influence the process of recall to a much greater extent than does the more recent, but acute, problem of temple entry. (*b*) Social attitudes affecting recall seem, with Indian students, to be largely depersonalized (cf. (13, 14, 15)) in the sense that

attitudes to policies and attitudes to persons show little overlap, as indicated by the championing of the outcaste without respect for him, the condemnation of the Brahmin without contempt for him, and the respect for the Englishman in spite of an acknowledged antagonism towards the British as a group.

In addition recall is affected by a mental habit of dealing with selected details rather than with generalizations based either on the perception of similarities, or on the organization of interrelated material (cf. also (12)).

XII. Summary

This paper reports a study in the recall of meaningful prose material at intervals over a period of 5 months. The subjects were students in an Indian college. The test material was prepared in equivalent forms in different languages, acquired and native to the student group, and administered to groups selected on a random basis. The results were analysed to discover the amount of original material remembered, the amount and nature of importations, the frequency and nature of transpositions, and the effects of certain social attitudes. Among factors found to have an influence on recall were lapse of time, degree of education, social status, language used, the nature of the material recalled, and social attitudes. Their influences were of following main types:

(i) *Lapse of time.* By itself, the lapse of time produced a considerable decrease in the amount of material recalled, but had no direct effect on method of recall. In conjunction with the language factor it had a considerable effect on transpositions.

(ii) *Degree of education.* As indicated by the difference between first- and third-year students, this had some effect in increasing the amount of material remembered, and the frequency of certain types of transpositions. Its most striking effects appear only when it occurs in conjunction with other factors.

(iii) *Social status.* This showed effects on the amount of importation, but few other measurable differences, either by itself or in conjunction with other factors.

(iv) *Language.* This, both by itself and in conjunction with other factors, had considerable effect on both the amount and the nature of recall. The use of the native language tended to facilitate recall of detail, inhibit importations, and facilitate transpositions, as compared with the use of the acquired language. In general, the use of the native language, as compared with the acquired, tended to facilitate the recall of detail, but not of the interrelationships between details.[1]

(v) *Nature of material recalled.* Differences in the subject-matter have considerable effects, both by themselves and in conjunction with other factors, on both the amount and the nature of the recall. This is specially true of differences between descriptive and narrative material.

When these factors occurred in conjunction, they had considerable effects on recall which could not be explained as the merely additive effects of their several separate contributions.

[1] Compare with this the result reported in (11), when it was found that the use of an acquired language in a test situation tended to make the Indian student rely more on eductive abilities than when using his native language.

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DEMOCRACY AND CHARACTER

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Since the appearance of national socialism on the political scene, the discussion about the democratic state has become especially lively. Is this form of state out of date or does it correspond to the conditions of modern life? Is it able to procure for the nations the greatest measure of prosperity and peace? Has it been proved to be good in the course of time and must it be preserved, or shall it be abolished as quickly as possible for another form of government? The arguments for or against democracy often have taken and still assume a passionate character. They were given until now from a political, social or juridical point of view. One thing has always been overlooked, which is that democracy in every form of human society has been created by men, that it has *its deepest origin in human nature* and that it satisfies the necessities of human nature. This means that we must understand and study the problem of democracy from quite another side, namely from the *psychological* point of view, because the soul of man, his spirit, not only builds the body, as the poet says: but the human genius creates all social and political institutions.

We shall explain this further.

Men receive from nature talents and aptitudes and qualities of character which are very different from each other. Two men, even with the same parents and grown up under the same conditions of life, are never equal, either physically or mentally. This difference has the greatest importance for the social life of men, because it necessitates a restriction of their inherent powers and therefore makes people dependent one on the other. Men always depend one on the other. To give an example from the sphere of aptitudes: amongst primitive peoples the one bestowed with great physical strength is able to swing the heavy hammer and he will be a blacksmith. Another is weak and sickly, but he has clever hands, he twists mats, he knots nets or makes pottery. So comes the *exchange* of products, because also the strong man wants to lie on a soft mat and the weak one needs tools and weapons to defend himself in case of necessity.

This state of dependence one upon the other not only creates one of the bases of modern economic life—commerce—but it leads also to the association of men in groups. The stronger protects the weaker by his physical strength, but in the days of his own or his family's sickness he will be assisted by the weaker who understands the healing power of plants.

The association of men is possible in different ways, because not only these material factors count. Most frequently we find two different forms. In one type of group the members are associated on the basis of equality. Every one *feels* himself *equivalent* to the other in spite of the existing differences of inclinations. "I am worth as much as you, because *my* contribution means also something for the whole." In the other form of association we see that one of the members, the bravest, the strongest, the wisest, but often also the greediest and the harshest, thinks himself as very high above the others, and the latter are also convinced of their inferiority and often they are intimidated into accepting this state of subordination. Many tribes or nations show one or the other form and therein we find the germ of what we call monarchy, despotism, absolutism, or democracy which means equality of the rights claimed.

We come to the conclusion that the development of a form of political life is very much bound up with certain psychological inclinations. It will be the same with its further existence. There is a deep, psychological reason why the Swiss nation has chosen the democratic form of association. If we read the Federal Letter of the Convention of 1291, we are impressed by the principal qualities of character of the confederates: the care of the commonwealth, the disposition to help one another, to assist one who is in need, to think and act in an honest and loyal way, the will for independence, the love of freedom and peacefulness. [This democratic union took place at a time when everywhere else in Europe the absolute power and prerogative of princes were victorious.] The qualities mentioned above have also been active in the Anglo-Saxons, because in England even in early days municipal autonomy created a means of independent action.

The tribes and nations who are ruled by a leader are 'led' and they willingly accept this leadership, because most of the members are little advanced intellectually, they have no judgement, no criticism of their own, no quick orientation to their different conditions of life, and therefore they willingly accept the protection of a strong man; or else the members lack the feeling of responsibility, of their own dignity, they lack the impulse to independence, they have not enough *character*.

Much is spoken and written about men's characters, but this important question is given too little scientific study, and the results of these researches do not penetrate to the broad masses of the people.

In this way we overlook the fact that our characters develop gradually, like intelligence and other faculties, so that we have to speak of *degrees of development of character* and for that reason also of its *maturity*. If we consider the character from the point of view of maturity we must confess that many people do not reach this maturity at all. They remain at a low level of character development. We must state that maturity of character is almost entirely independent of intelligence and of the other faculties. One can have had a good education, one may even have passed university examinations very successfully and yet one may be a scoundrel. On the other hand there are people with little or moderate intelligence who distinguish themselves by their high qualities of character, especially by strong social feelings. There is in this way an independent development of the different psychological dispositions.

Research on children and young people has shown clearly a ripening of character. The period of puberty affords an especially valuable field for research. It can be shown that during the time of physical ripening a maturation of character also takes place. The youth feels the development of his mental powers, and soon he feels himself strong enough not to stay for ever under the protection of his parents; he wants to act alone and according to his own will. So begins the detachment from the parental power which often casts a deep shadow on the relations between parents and children. If young people can only strive for this detachment without having enough strength or experience to obtain it, then they feel themselves in need of a leader. This leader may be the teacher, a relative, or a personality known in social life, whom they want to imitate. Sometimes it may be an older experienced friend or comrade. But when they have reached mental maturity *they want to get rid of the leadership, to be independent and to act alone*. The distinctive features of the character and personality are then formed. Unfortunately, there are many young people who will never reach this state; they remain at the first stage of character ripening, and they remain dependent minors all their life.

Among the nations we can find the same state of things. A whole nation can reach a very high level of character development, but it can also remain backward as far as its character is concerned. In consequence of the above-mentioned autonomy of mental dispositions, such a nation can create technical miracles, it can be a master of organization, and yet it can have a lower level of character development than have many primitive nations which we often call primitive only because they have not much technical aptitude.

Nowadays we have a very clear example of these facts before our eyes. A nation was the first in all that concerns capacity for work, technical knowledge and power and scientific efficiency. Yet the character of this nation was not highly developed, neither had it the impulse towards independence, nor the feeling of its responsibility, nor the consciousness of itself and of its human dignity. Like a youth during puberty who has not the right orientation towards a world that is new to him, this nation called for a leader to whom it subordinated itself all too willingly and completely.

A whole nation can therefore be considered to remain arrested in its development of character at the stage of puberty, and it does not advance from this level. But there is still another possibility: in pathological cases the already well-developed individual can regress to the stage of puberty. *A nation also can regress to a former phase of development.* It can advance from such a state only under very favourable conditions, perhaps only with foreign help.

We see that very important phenomena of psychological causation in the political life of a nation can be explained in this way. The destiny of a nation as well as that of an individual depends on its character. The kind of state which a nation chooses depends to a high degree on the character of its citizens. The higher the level of character development, the more human will be the community. Democracy is therefore possible only for nations with very well-developed social feelings. *The way to democracy leads through character development.*

ASSESSMENT FOR FOREMANSHIP[1]

By NANCY TIMPANY, *From the Medical Research Council's Applied Psychology Unit, University of Cambridge*

I. *Introduction* (p. 23). II. *Method of approach* (pp. 24–26): (*a*) *Test HT* 1 (p. 24); (*b*) *Ratings of foremanship* (pp. 24–26). III. *Analysis of findings* (pp. 26–27). IV. *Plans for further work* (pp. 27–28). V. *Summary and conclusions* (p. 28).

I. Introduction

During the early years of the war the Ministry of Labour organized a steady flow of manpower from industry to the armed forces. In 1943 even the skilled men who had occupied key supervisory positions were rapidly disappearing, and industry was faced with the problem of upgrading on a wide scale.

In a few engineering factories, intelligence and aptitude tests designed by members of the Medical Research Council's Unit of Applied Psychology were already being used as an aid to the selection and allocation of new entrants. Some members of the staffs of these firms thought that psychological tests might be of use in helping to select new foremen and charge hands, and they asked the appropriate members of the Applied Psychology Unit for further advice.

During the preliminary discussions, it became clear that the difficulty in upgrading was not primarily in deciding which individuals possessed the *technical knowledge* required by a good supervisor. It was relatively easy to assess a man's or woman's technical knowledge, and, in addition, an estimate of the potential ability to acquire technical knowledge could be obtained by the use of an intelligence test. Intelligence Test AH 4 was given to a group of experienced foremen, and the results showed that whereas the majority of foremen gaining low scores were rated as *poor* foremen, those individuals gaining high scores obtained a variety of ratings, from poor to excellent. It would be possible, therefore, to eliminate a few people on intelligence test score alone. But it appeared that the real problem with the remaining individuals who obtained high intelligence test scores was to decide which possessed the qualities of *personality* and *temperament* necessary in the good supervisor. Would Mr Brown, who had been operating a capstan lathe quietly and efficiently for over a year, display the tact, firmness, patience, integrity of character and breadth of vision, which, it was asserted, would be essential when he was promoted to the position of charge hand of the capstan section?

The investigators were asked whether they had a test which could provide the answer to questions of that kind. The reply was, regretfully, no, they had not, but they were eager, if industry would co-operate, to attempt to devise one. Such a test could not be along the lines of the clinical temperament tests, such as the Rorschach or Mosaic tests, since these were too lengthy to administer, and too subjective in interpretation. The test would have to be a fairly short group test, easy to administer and *objective* to mark—this last condition, it was realized, was likely to be the most difficult to fulfil. The most profitable line to pursue seemed to be that of the paper and pencil 'dilemma' type of test, and with this in mind, Test HT 1 was designed.

[1] The foremanship investigation described in this paper was initiated and directed by Dr A. W. Heim, and she was largely responsible for devising Test HT 1. The writer would like to express her thanks for guidance in suggesting fruitful lines of inquiry, and in the interpretation of results, and for the encouragement she has received from Dr Heim throughout the investigation.

II. Method of approach

(*a*) *Test HT* 1

Test HT 1 was designed by A. W. Heim and N. Timpany, and is a paper-and-pencil test with twenty-three questions. Each question describes a concrete factory situation, and the subject is asked what he would do in those circumstances, if he were the foreman. Six possible answers are given for each question, and the subject is asked to choose the one which describes the line of action he would take. If he does not agree with any of the solutions provided, he is allowed to make up, and give, his own answer.

An example (used as an example to be answered by the subjects before they started the test) of the type of question and solutions is as follows:

You have two or three workers on your section who often slack. Your output is usually up to schedule owing to the keenness of the majority of your people. What do you do about the few slackers?

(*a*) Speak strongly to them.
(*b*) Try to find out the reason for their slackness.
(*c*) Get them transferred to another section.
(*d*) Consult the management about them.
(*e*) Talk encouragingly to them.
(*f*) Put them on to the most unpopular jobs, till they improve.

It will be seen from this example that all the answers were reasonably sensible. There were no *right* or *wrong* answers to the questions; the investigators were anxious that the intelligence of the subjects should not play an important part in determining their test results, and they thought that if there were one correct answer to each question, the more intelligent subjects might have an advantage over the less intelligent ones. The choice of answer would, they hoped, depend largely on the particular temperament and character of the subject giving that answer.

In devising the questions and answers, the help of many people working in industry was enlisted, and the provisional draft of the test was criticized by a number of general managers, works and assistant works managers, personnel and labour officers and training supervisors from several different factories. By these means it was ensured that the questions and answers were representative of the majority of situations which the average foreman is called upon to deal with in his everyday life in industry.

No time limit was given for the test, but it was suggested to the subjects that three-quarters of an hour was a reasonable time to take, and in fact it was found that subjects rarely took longer than one hour to complete the test.

(*b*) *Ratings of foremanship*

Having devised the test, some criterion against which to measure the results was required. This problem was discussed with people with industrial experience, and it was decided to obtain from members of the factory staffs ratings of the subjects tested on certain qualities which were held to be involved in good foremanship. Many qualities were suggested, but after much discussion of their practical implications it was decided that the following six qualities were the most important. These were:

(1) Ability to get on with the workers.
(2) Ability to co-operate with the management.
(3) Technical knowledge.

(4) Organizing ability.
(5) Ability to maintain discipline.
(6) Initiative and improvising ability.

Technical knowledge was included in the list because, though the test did not aim at assessing this, it was thought to be so important that if omitted it might well influence the ratings given on the other qualities.

For two main reasons, the ratings were to be obtained on six separate qualities rather than on the single quality of general efficiency as a foreman. It had been found in the past that this method of splitting up a general rating into several more specific ones tends to reduce halo effect. In addition, the investigators wished to gain insight into the more detailed application of the test; for example, to determine whether certain questions were more diagnostic for certain qualities than others.

The general plan of the preliminary investigation was to give the test to groups of experienced foremen and charge hands and have them rated on the six qualities. The ratings would then be compared with the test answers, and it was hoped that some pattern of answers would emerge, certain answers being agreed upon by individuals rated highly on the qualities, and other, different, answers being agreed upon by individuals rated low on the qualities. This would provide the basis of an objective scoring key for the test.

The results of the first few groups of foremen were disappointing, mainly because the ratings were unsatisfactory. The ratings had been obtained on a ten-point scale, but it was found that the vast majority of foremen had been rated as five or six. At least two independent ratings on each foreman had been made, but in many cases the range and mean of the ratings given by one rater were different from those given by another, and it was difficult, therefore, to combine the ratings. Finally, as far as it was possible to judge, there seemed to be insufficient agreement between the raters.

A different method of obtaining ratings, the paired comparisons method, was therefore tried. The groups of subjects to be rated by this method must be small since the ratings are arranged in pairs, each subject being compared with every other. It is advisable to obtain ratings from two or more raters for each set of comparisons, and the subjects should be arranged in groups such that raters can be chosen who know every member of their group well enough to make a judgement.

For each set of paired comparisons the self-consistency of the rater can be estimated statistically by calculating the coefficient *zeta*. An inconsistency in paired comparisons takes the form of a circular argument, that is, A is judged better than B, B is judged better than C, and C is judged better than A. If no circular arguments exist, then the coefficient *zeta* is $+1$, and it can be assumed that the rater has a clear conception of the relative merits of his subject with reference to the quality under consideration.

The agreement between two or more raters of the same group of subjects can also be estimated statistically by calculating the coefficient of agreement, u. If this is high, then the raters concerned agree, to a great extent, in their judgements.

If the self-consistency of each rater is high, and there is a significant agreement between several raters, the *validity* of the ratings is still not proved, since it is possible that all the raters have clear and similar, but nevertheless mistaken, conceptions of the quality they are rating. This is, however, a more theoretical problem, depending on the definition of the quality under consideration, and for practical purposes, by combining the paired

comparison observations of the raters, a ranking of the foremen is obtained which, it can be assumed, provides a reliable criterion for comparison with test results.

A full description of the method and theory of paired comparisons is given in *The Advanced Theory of Statistics*, vol. I, by M. G. Kendall.

III. Analysis of findings

Test HT 1 was given to six groups of foremen from three different factories, some fifty foremen in all. Paired comparisons ratings were obtained from members of the senior supervisory staffs, on each group for each of the six qualities. The self-consistency of each rater was estimated, and the agreements between the two or more raters who had assessed each group were calculated. The self-consistency in all cases was high, and in only one case was the agreement between the raters not significant; this group was therefore eliminated for that particular quality. Thus the paired comparison observations could be combined to a final rank order for each group for each quality.

The test groups had been small, and there was no way of combining the rankings obtained for each group into a single ranking for all subjects. In order to compare ratings with answers for all subjects, a preference method was devised by Mr Whitfield of the Applied Psychology Unit, and was found to be a suitable way of treating the data. For each group of subjects, for each quality, a table was drawn up of the answers given to the twenty-three questions. The answers to each question were arranged in the rank order of the subjects giving those answers. Then, for each question, the preference displayed for each answer was determined. Consider, for example, the answers of a group of ten subjects to any one question. Suppose Answer *A* is given by the foreman ranked top and by no others, then Answer *A* was preferred to nine other answers, and we could say that it had a *positive* preference of 9. No other answer was preferred to Answer *A*, so the *negative* preference was 0. Suppose, however, that Answer *B* was given by foremen ranked 7th, 8th and 9th, then it was preferred to 3, plus 2, plus 1, other answers, and its positive preference would therefore be 6. But all the answers given by the foremen ranked 1 to 6 had been preferred to it, and thus the negative preference of Answer *B* would be 6, plus 7, plus 8, giving a total of 21. The ratio of positive to negative preference in this case would be 6 to 21. This ratio of positive to negative preference for any one answer will be referred to as the 'Preference Ratio'.

When the preference ratios had been calculated for each answer to each question for each separate group, the results for these groups could be added for each question, giving a set of total preference ratios. To obtain a single measure of the value of each answer, the proportion of positive preference to the sum of positive plus negative preference was calculated, and multiplied by ten to give the results in whole numbers. A correction, consisting of the addition of 1 to the lower preference in each case, was applied in order to minimize the effect of the lower frequency ratios. Thus a score of 5 would indicate equality between the positive and negative preferences, an answer gaining such a score being neither 'good' nor 'poor'. Scores above 5 would indicate that the answer was a 'good' answer, and scores below 5, that the answer was a 'poor' answer. The *significance* of the deviation away from 5 in each case could be estimated using the Binomial method. Thus for every question, scores were obtained for each possible solution, according to which quality was considered. For example, in any one question, Answer *A* might achieve a preference ratio of 19 to 8, giving a score of 6·79 for the quality "Ability to get on with the workers".

For the quality "Ability to maintain discipline", however, it might achieve a score of only 4·35. Answer *B*, on the other hand, might gain a score of 3·23 for the quality "Ability to get on with the workers", a score of 5·00 for the quality "Ability to maintain discipline", and a score of 7·21 for the quality "Technical knowledge".

A provisional marking key was established in this way, on the basis of the results obtained from the fifty foremen tested and the ratings made on them.

It was hoped that the answers to the test had followed some consistent plan, individuals rated high in each group tending to give the same answers and those rated low tending to agree on other answers. In order to estimate how far this had been the case, the scores for each individual for each quality were calculated, using the total key, and compared with ratings for each group separately. Rank coefficients τ were calculated and the means of the coefficients for the six groups for each quality were as follows:

Technical knowledge	$= +0{\cdot}55$
Initiative and improvising ability	$= +0{\cdot}59$
Ability to get on with the workers	$= +0{\cdot}67$
Ability to maintain discipline	$= +0{\cdot}68$
Organizing ability	$= +0{\cdot}74$
Ability to co-operate with the management	$= +0{\cdot}75$

These figures provide some evidence that the answers had formed a consistent plan. If the individuals in each group had selected their answers entirely at random, the preference scores would tend to be 5 in every case, and no correlation between scores and ratings would exist. If, however, the answers within each group had formed some plan, but there had been little agreement between the different groups, then there would be a certain unknown degree of correlation between scores and ratings because of the representation of each group in the key. As six groups were represented in the key, it seems unlikely that correlation figures of the order obtained could be expected unless there was some agreement between the groups, as well as a plan of answers within each group. Moreover, the groups were drawn from three different factories and from many different departments, so that the application of the test and its key would not be likely to be confined to a particular type of supervision only.

IV. Plans for further work

Much further work remains to be done. The next step is to test a different group of foremen, score their answers by the provisional key already obtained and see how far their scores agree with ratings made on these foremen for the same qualities. If good agreement is obtained it will indicate that, in so far as the ratings on the qualities may be regarded as reliable, the test is a valid instrument for assessing these qualities in experienced foremen.

It would be advisable then to increase the amount of data used to establish the key, since the small group of fifty foremen already included can hardly be regarded as representative of engineering supervision throughout the country. The discriminative value of each individual question should also be examined, so that the test (which is at present rather too long) may be shortened by the elimination of questions which have little or no discriminatory effect.

When this has been done, the test can be given to the people for whom it is really intended, the *potential* foremen and charge hands. They should then be followed up over a long period, and their ability as supervisors compared with the scores they obtained on

Test HT 1 before they had any experience as foremen. If this proves successful, Test HT 1 can be regarded with confidence as a test which predicts the ability to get on with people, to organize, and to maintain discipline necessary to the potential supervisor.

Many questions of theoretical interest have arisen in connexion with the investigation, and it is hoped to follow these up in the future. A few of these problems may be outlined as follows:

(1) The qualities used as a criterion for foremanship require further examination; ratings should be obtained on all-round efficiency as a foreman, and these compared with the ratings obtained on the separate qualities; the relative importance of the different qualities should be investigated, and also the relevance of different qualities to different types of supervision.

(2) A comparison should be made between scores obtained on Test HT 1 and intelligence test scores, to find out how far the temperament and personality traits examined are related to intelligence.

(3) Some subjects who did not agree with any of the suggested answers to certain of the questions, made up their own answers. In the analysis described in § III, all these answers were called "Own answer" and treated as a uniform group. This method was employed because it was felt that at this stage of the inquiry a detailed analysis of individual "Own answers" was less important than the establishment of an objective marking key for the test. An examination of "Own answers" should provide further interesting data.

V. Summary and conclusions

1. As a result of discussion with members of industry, it became clear that some scientific method of assessing temperament and personality traits in potential foremen was required.

2. Test HT 1 was devised in an attempt to assess objectively some of the qualities essential for the good foreman.

3. The test was given to six groups of experienced foremen, and ratings were obtained on them using the paired comparisons method.

4. The self-consistency of each rater, and the agreement between different raters, were investigated and found to be satisfactory.

5. The ratings were compared with the answers given to Test HT 1, using the preference method, and an objective scoring key for the test was constructed on the basis of these findings.

6. The agreement between groups of foremen on the answers to the test was investigated by comparing the scores of each separate group of foremen with ratings, satisfactory correlation figures being obtained.

7. Proposed future work consists of the validation of the test, and the investigation of certain more theoretical problems which have arisen in connexion with the inquiry.

In conclusion, it should be stressed that the main interest of the work at present is that a test of personality or temperament has been devised which is capable of objective scoring, and that a method of establishing the marking key of such a test has been investigated with promising results. The applications of this method of investigation to fields wider than that of supervision in industry might provide scope for further research.

THE NATURE OF PERFORMANCE TESTS: AN EXPERIMENTAL STUDY

By R. COCKETT, *From the Psychological Laboratory, Birkbeck College, London*

I. *Introduction* (p. 29). II. *Experiments* 1 *and* 2 (pp. 30–33). III. *Discussion of Experiments* 1 *and* 2 (p. 33). IV. *Experiments* 3 *and* 4 (pp. 34–35). V. *Conclusions* (pp. 36–38). *References* (p. 38).

I. Introduction

It is notoriously more difficult to construct a reliable performance test than to construct a reliable written test. In the latter case, adequate reliability is achieved mainly by *homogeneity* of test content, or *internal consistency*, plus adequate *sampling* of the testee's ability, or *length* of test. The split-half correlation coefficient is the statistic used for such reliability measurement, and attention is directed mainly to the perfection of the test itself as a measuring instrument, rather than to the stability of the function being measured. There are, nevertheless, techniques for ascertaining the stability of such functions as can be measured by paper-and-pencil tests (1). In the case of performance tests, however, the question of internal consistency usually does not arise, since the tasks involved in most performance tests have a unitary quality, being of one of the forms: how well or accurately can you do this, how quickly can you do this, how many of these can you do in x minutes, how long do you take to do these y things. In this case, the problem of reliability is the problem of the *stability of the function* tested, plus adequate *sampling* of the function-in-action. Here, the test-retest correlation coefficient is used for reliability measurement.

The experiments to be described in what follows were carried out in an attempt to throw light on certain aspects of this general problem of reliability in performance tests. If we may presuppose complete standardization (i.e. non-variability) of the apparatus and of its use, and a completely objective method of reaching a score to represent the quality of a subject's performance, test-retest correlation coefficients for a performance test will be less than 1·00 only by virtue of non-uniform variations, in successive performances, of the individual subjects. Under these conditions, the greater are individual variations relative to individual differences, the lower will be the test-retest correlation coefficient. If, therefore, it were possible to discover under what conditions of progressive test modification individual variations become progressively smaller relative to individual differences, a basic feature essential to reliable performance tests would have been isolated.

The initial hypothesis it was desired to examine was that a performance test must require activity of at least some minimum degree of complexity before it can be reliable in the psychometric sense, i.e. that the more complex the activity, the more stable is the function involved. As it turned out, the hypothesis proved to be an invalid one, but introspective considerations and certain features of the subjects' performance suggested a further one, which may be expressed as follows: to be reliable, a performance test must demand bodily action under continuous conscious guidance, that is, the behaviour required must be genuinely *psycho-physical* throughout.

II. Experiments 1 and 2

Exp. 1. Since initially it was intended to investigate the effect of increasing the complexity of the task involved, it was necessary to start with a very simple type of activity known to yield, when measured, unreliable results (in the psychometric sense), i.e. a type of activity in which differences between individuals' averages are relatively small as compared with the variability of each individual. The average performance and the variability of performance of an individual cannot, of course, be reliably measured by only two observations (such as is required for the calculation of test-retest correlation coefficients), so that the task selected had to be one that could conveniently be repeated a considerable number of times for each subject. The simple reaction time at once suggests itself as meeting these conditions; and all that was necessary was to devise some apparatus which basically required some simple behaviour reaction (which could be progressively made more complex) in response to a simple stimulus.

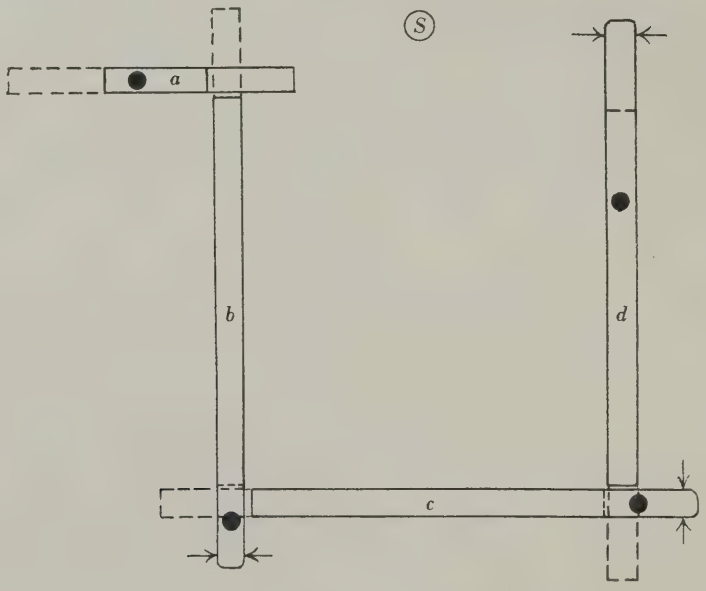

Fig. 1. Plan of apparatus used in Experiments 1 and 2.

The apparatus designed for this purpose consisted of four sliding metal bolts set in a baseboard in such a way that they could only be shot along their traverses in a set sequence, each bolt in its rear position blocking the path of its successor. Fig. 1 shows a plan of the arrangement. The bolt-handles were so placed that the four bolts were to be operated successively by the middle finger of the left hand, the left thumb, the right thumb, and the middle finger of the right hand. The subject kept his hands in position touching the bolt-handles at all times before the stimulus was presented. The stimulus consisted of the appearance of a light from an ordinary electric torch bulb set in the baseboard at *S*. At the rear of the second, third, and fourth bolts were electrical spring contacts, each set being in a separate, alternative electric circuit which included the stimulus bulb; a bolt in its rear position completed an electric circuit, therefore, when current was switched on by the experimenter. The total movement of each bolt was a

fraction over 1 in., and each had to be moved fully before its successor could be moved; the electrical circuits were broken, however, after approximately $\frac{1}{4}$ in. had been traversed in each case. (Only one electric circuit was in use at any one time.) This apparatus could thus be used for recording the reaction-time of subjects shifting one bolt on appearance of the light, or with progressively increasing complexity, of shifting two, three, or four bolts in a fixed sequence with fixed, different parts of the two hands. A Venner Time Switch was used for measuring reaction-times.

In Exp. 1 bolt *b* was used for the simplest reaction, bolts *a* and *b*, bolts *a*, *b* and *c*, and all four bolts, for the successively more complex reactions. Nine subjects were tested, each having forty trials at each of the four levels of complexity of the task, in a single sitting of about half-an-hour. The trials were carried out in sets of ten, the four levels of complexity being interspersed throughout the experimental sitting in an attempt to ensure that any practice effect and any general fatigue effect was more or less evenly distributed over the four levels.

Means and standard deviations for the nine subjects, and the standard deviation of the nine means, were computed for each of the four levels of complexity of the task. Such data afford all the necessary evidence by which to test the initial hypothesis, for if the increasing complexity of the task results in increasing test-retest reliability (i.e. involves an increasingly more stable function in respect of which individual differences exist) the standard deviation of the nine means should increase relative to the average of the standard deviations of the individual subjects. In other words, the question is simply: does the value of the fraction σ_{means}/average $\sigma_{\text{dis.}}$ increase with increasing complexity of the activity? The value of this critical fraction for each level of complexity is shown in the first line of Table 1. It will be seen that, far from increasing, it actually decreases steadily. (Level *A* is the simplest form of task, and *B*, *C*, *D*, are progressively more complex.)

Table 1

	Level of complexity of task			
	A	*B*	*C*	*D*
(i) Value of σ_{means}/average $\sigma_{\text{dis.}}$	0·717	0·652	0·579	0·567
(ii) Value of σ_{means}/average $\sigma_{\text{dis.}}$	1·059	0·843	0·877	0·611

Now in all forms of the task, the combined results of all nine subjects showed some improvement with practice and such improvement is more marked in the more complex levels. Fig. 2 shows the general trend of improvement at each level. It was therefore possible that such improvement (naturally tending to increase each subject's σ values) had a decisive effect in producing the results obtained. It will be seen from Fig. 2 that generally speaking the improvement ceased about half-way through the series of trials, and accordingly the statistical work was repeated using only the last twenty trials for each subject at each level. The results obtained are shown in the second line of Table 1, and again show a trend of decreasing value of the critical fraction with increasing complexity of task. (The value at level *B* is unduly depressed apparently because, as Fig. 2 shows, there was still further improvement in the case of this level in the last twenty trials.)

Exp. 2. It will have been observed that in the first experiment the levels of complexity of the task had been built up from left to right, levels *A* and *B* involving entirely the left hand. With one exception, all the subjects were predominantly right-handed, and it was decided to repeat the experiment with the same subjects, building up from right to left.

In Exp. 2, the successive levels of complexity of the task were therefore bolt *c* (right thumb), bolts *c* and *d* (right thumb, right middle finger), bolts *b*, *c*, *d* (left thumb, right thumb, right middle finger), and finally all four bolts as previously.

The general trend of practice effect is shown in Fig. 2 alongside those of the prior experiment; it will be seen that there is much less improvement, and also that at each level of complexity the subjects started at the quality at which they had finished in the

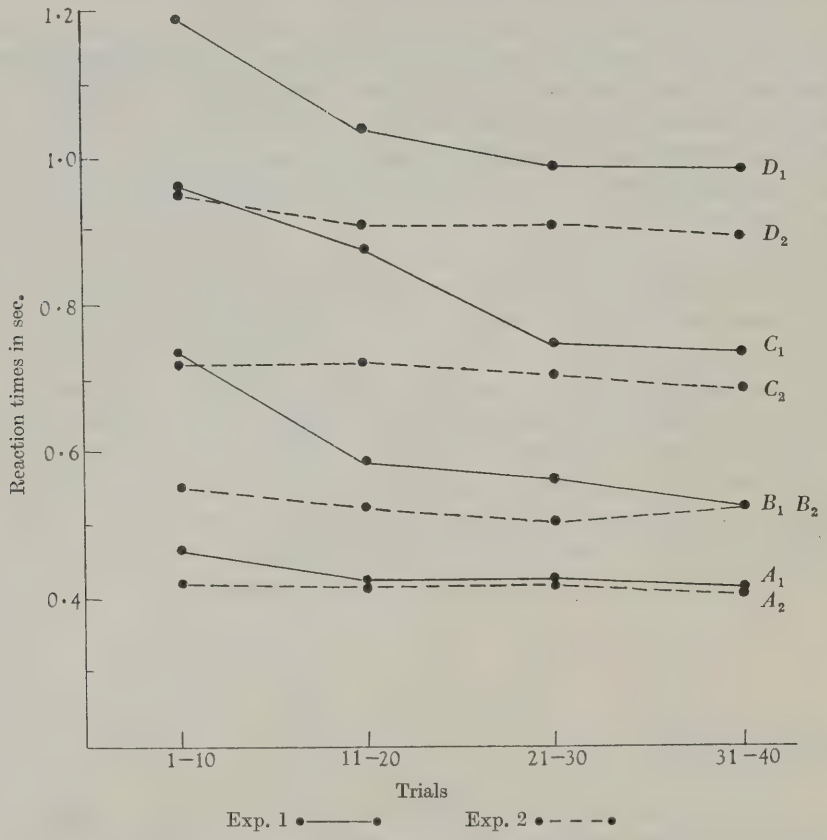

Fig. 2.[1] Improvement curves (all subjects) in Exp. 1 and 2.

corresponding level in Exp. 1. That is, improvement in Exp. 1 seems to have been transferred to the present experiment, although at each level except *D* the task involved different neuro-muscular apparatus.

The resulting data were handled as before, giving the values for the critical fraction shown in Table 2. Line (ii) of this table deals with the middle twenty trials at each level, since these seem from Fig. 2 to be those where improvement or its reverse were least evident. It will be seen that the results substantiate those previously obtained, except for the values under *D*. These, of course, are not comparable, since the task at this level

[1] The reaction times recorded for the simplest level should not be compared with those normally obtained in experiments where the subject merely has to release a morse key, for at least two reasons: (i) the bolt had to traverse about $\frac{1}{4}$ in. before the electric circuit was broken in each case, and still more important (ii) the use of the Venner Time Switch in the circuit resulted in a delay between switching on the current and the appearance of the stimulus light; this delay was about 0·15–0·2 sec.

was identical with that in Exp. 1, and consequently the subjects had now had twice as many trials at this level.

Table 2

	Level of complexity of task			
	A	*B*	*C*	*D*
(i) Value of σ_{means}/average $\sigma_{dis.}$	0·965	0·928	0·892	1·071
(ii) Value of σ_{means}/average $\sigma_{dis.}$	1·200	1·115	0·990	1·221

III. Discussion of experiments 1 and 2

The two experiments just described seem to indicate fairly conclusively that whatever the reliability of a performance test depends on, it is not the degree of complexity of the neuro-muscular action demanded. The more complex neuro-muscular reactions actually provide less stable individual differences than the simple reaction. This would appear to be because the complicating of the reaction involves combining two, three, or four already unstable functions into larger units of neuro-muscular activity, resulting in (relatively) less and less stable functions.

Now the classical experiments on voluntary reactions originally carried out by Ach (2) indicated that "the foreperiod between the ready-signal and the stimulus contained everything of reportable significance, while the mid-period and after-period contained little or nothing" (3) that was open to introspection. This means that the mental aspect of the whole process is confined entirely to the beginning, and what is measured in the simple voluntary reaction time experiment is an afferent-efferent sequence consequent upon some preliminary mental process. Certain features of the experiments reported above suggest that this is still true however complicated the neuro-muscular response demanded by the experimental conditions; that is, at all the levels of complexity, the processes involved still remained in this same form of an afferent-efferent sequence predetermined by a preparatory 'set'. The features in question were what the experimenter observed to happen when a subject 'got stuck' in reacting. This could happen for either of two reasons in all except the simplest form of reaction: if a bolt was not quite completely shot along its traverse, the succeeding bolt would not move (the clearance between bolts *b* and *c* and between bolts *c* and *d* when in their forward positions was less than $\frac{1}{32}$ in.); alternatively, if pressure was applied to any of bolts *b*, *c* or *d* before the appropriate predecessor was moved, there would be a strong brake effect by reason of friction between the two bolts concerned. Such 'obstructed' reactions occasionally (though only very infrequently[1]) arose, resulting in abnormally long reaction-times; and characteristically what happened was that the subject would go on pushing at the bolt that would not move, only on 'second thoughts', so-to-speak, realizing that other parts required readjustment (an extra push to the preceding bolt, or release of pressure on the succeeding bolt). This clearly suggests that in the normal, unobstructed, course of events, the total reaction was, as in Ach's experiments, predominantly if not entirely a complex of neuro-muscular processes with little or no conscious guidance, only preceded by a mental 'fiat', to use James's term. The *movements* involved seemed to fuse into a complex unity of action.

[1] Not frequently enough to have had any material effect on the results already presented, despite the fact that there was a greater chance of such obstructed reactions occurring at the more complex levels of the task. The results of Exp. 1 were recalculated omitting such stray, exceptionally long, reactions that stood out from their neighbours in the list of reaction-times, with no essential difference appearing.

IV. Experiments 3 and 4

The foregoing considerations suggest a new hypothesis as a possibility: that the essentia requirement for a reliable performance test is that it shall demand activity which i consciously guided throughout, i.e. in which more than neurological processes are involved If this were true, it would mean that the functions that are relatively stable within a individual, and different between individuals, are essentially mental functions, or at leas functions which involve the continuous interplay of receptor and effector processes.

Exp. 3. As a first attempt to test this new hypothesis, an experiment was designed i which the subject's task was to throw a number of switches, series of 2, 3, 4 and 5 switche providing respectively the four levels of complexity. Ordinary household electric ligh switches were used, set at equal distances at 4 in. intervals on the wall just below waist height. Each trial was begun with the switches in the down-position, and the subject ha merely to flick them successively into the up-position, using the outer edge of the crooke right index finger. The electrical arrangements were such that operating the first switc completed the circuit, and the second, third, fourth, or fifth, at the experimenter's wil broke it again. As before, the reactions were to be carried out as fast as possible, and th trials were taken in sets of ten with the four different levels interspersed throughout th experimental period. This experiment is not strictly comparable with the preceding one since there was no presented stimulus of any kind: the subject started each reaction at h own pleasure. Since, however, the same part of one hand had to be used two or mo times in succession, the processes involved are without question an integration of recept and effector events: the subject had to watch for each succeeding switch so that the fing was guided into the right place, as contrasted with the previous experiments in which a reacting digits were in position before any reaction commenced. The several levels activity here thus differ in that they take a progressively bigger sample of *continuou integrated receptor and effector processes.*

Eight of the previous nine subjects did forty trials at each of the four levels of the tas Treating the resulting data as before, the values of the critical fraction shown in Table were obtained. There was less improvement with practice in this experiment than in th preceding ones (see Fig. 4 infra, where all practice curves are shown) but the midd twenty observations at each level were examined independently (line (ii) of Table 3).

Table 3

	Length of task			
	A (2 switches)	*B* (3 switches)	*C* (4 switches)	*D* (5 switches)
(i) Value of σ_{means}/average $\sigma_{dis.}$	0·814	0·686	0·908	1·198
(ii) Value of σ_{means}/average $\sigma_{dis.}$	0·711	0·792	0·993	1·612

It will be seen that the value of the critical fraction progressively increases wit increasing amounts of activity of the sort involved here, with the single exception of th value under *B* in line (i).

We may note one or two points regarding this experiment and its results. If th distributions obtained at each of the successive levels of the task had been the results sheer mechanical activity in arithmetically larger amounts, we should not expect th value of the critical fraction to alter from *A* to *D*, since all the spreads of values (individu

$\sigma_{dis.}$ values and σ_{means}) would tend under these circumstances to increase proportionately. This was not the case; although the $\sigma_{dis.}$ values increased (on average from 0·059 sec. at *A* to 0·124 sec. at *D*), they did so at a slower rate than did the σ_{mean} values. This clearly means that some more stable function is progressively more adequately sampled in the successive levels of the task than was present in the former experiments. This can only be identified either with the fact that the task involves the continuous integration of receptor and effector processes, or with the fact that the task was not a reaction to a presented stimulus but was carried out in each trial when the subject himself was 'ready'. A further point of interest is that if, in the course of one of the longer reactions, a switch was not properly thrown (they had rather strong springs and rather short levers) the subject would repeat the same switch without hesitation, so that in these cases the reaction included two attempts at one or other of the switches. The lack of hesitation suggests genuine integration of receptor and effector aspects of the whole performance, or continuous conscious guidance of muscular activity. There was no question of a belated awareness that something had gone wrong. Such occurrences naturally resulted in unduly long reaction-times, increasing the $\sigma_{dis.}$; and this effect would be greater in the longer forms of the task, where more switches were involved, because there was a greater chance of its occurring. Nevertheless, in spite of this imperfection in the experimental situation, we find the increasing values of the critical fraction.

Exp. 4. In order to check that these results were not due to the fact that the task was free of any presented stimulus, a further experiment was performed. In this case, the bolts were taken from the earlier apparatus and remounted in a fresh baseboard, this time in parallel traverses at $2\frac{1}{2}$ in. intervals. The bolts were thus entirely independent in their action, but, using the electrical contacts, the reactions could still be made on the presentation of a stimulus. A plan of the arrangement is shown in Fig. 3. Each bolt had to be moved in succession using only the crooked right index finger. The subjects began each reaction with the finger in place at the first bolt, so that the simplest form of the task was exactly comparable to that of Exps. 1 and 2. In the more complex forms of the task, the finger had to be shifted to the handle of each bolt in turn, just as in moving from switch to switch in Exp. 3. For purely practical reasons an auditory stimulus was used in this experiment.

Eight entirely new subjects did the trials, carrying out twenty trials each at each level of the task. Treatment of the results as before yielded the values of the critical fraction shown in Table 4.

Table 4

	A	*B*	*C*	*D*
Value of σ_{means}/average $\sigma_{dis.}$	0·447	0·797	1·233	1·055[1]

These figures confirm that the difference between the results obtained in Exp. 3 and 1 (or 2) are not due to there being no presented stimulus in Exp. 3.

[1] This figure is unexpectedly low, probably due to the fact that the bolts of the apparatus were not really suitable for use in this form. The rear ends were sharp at the edges, so that there was some small danger of minor abrasion of the finger when operating at speed if the finger missed the handle; and the handles themselves were rather small. The occasions when such inaccurate operating (often requiring a second thrust at the same bolt) occurred would naturally accumulate more at the higher levels of the task. The actual incidence of such occurrences at the several levels was *A* 0, *B* 3, *C* 9, *D* 20, in 160 trials in each case. The high incidence at *D* probably resulted in $\sigma_{dis.}$ values disproportionately large enough to produce the depressed value for the critical fraction.

V. Conclusions

There remains to be dealt with one further consideration in regard to these four experi-ments. As was stated in § I, an important feature of both pencil-and-paper and performance tests is the adequacy of the sampling of the function being measured, in order to ensure reliable measurements. Adequate sampling means making subjects do enough to reveal, in measurable form, the differences between them in respect of the

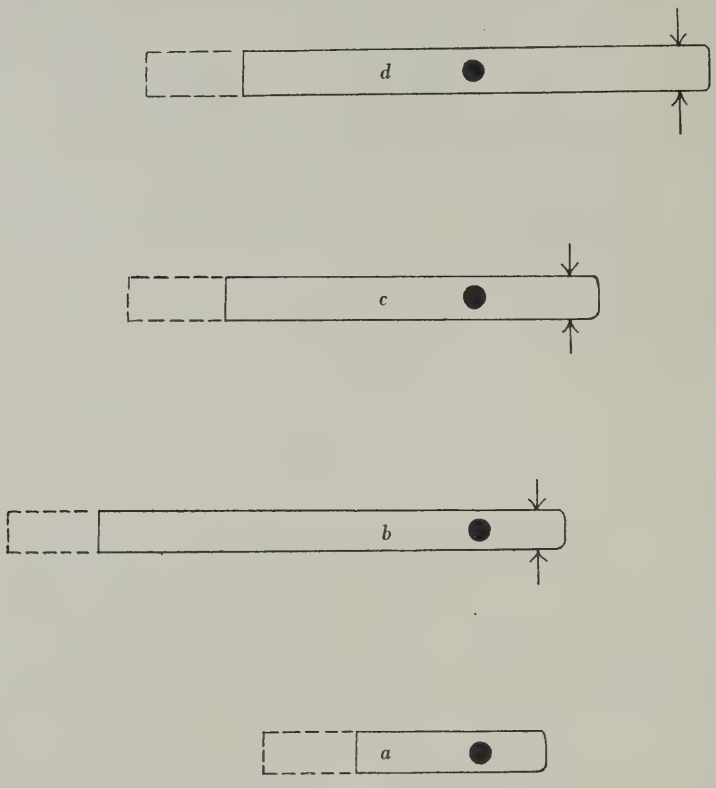

Fig. 3.[1] Plan of apparatus used in Exp. 4.

function concerned. In performance tests, this involves letting the behaviour continu for an adequate period of time. It remains, therefore, to compare the four experiments level by level, from the point of view of the length of the reaction-times. This comparison is made in the separate parts of Fig. 4.

There can be no question of differences in the time required for the several activities (or sampling) accounting for the different results of the two pairs of experiments. There is clearly little to choose between them so far as average time taken is concerned. In Exps. 3 and 4 the reaction-times increased slightly faster from *A* to *D* than those in Exps. 1 and 2; nevertheless, this cannot account for the totally opposite trend in the results reported above.

[1] As will be seen from Fig. 1, the bolts were not all the same length, so for Exp. 4 they were set in the base board so that they each had the same length of traverse as for Exps. 1 and 2, and the handles were in a straight line. The several levels of the task were *A*: bolt *b*; *B*: bolts *a* and *b*; *C*: bolts *a*, *b* and *c*; and *D*: bolts *a*, *b*, *c* and

The differing results were evidently due to a difference inherent in the tasks, a difference that has already been described (§§ III and IV). It must therefore be concluded that a fundamental requirement in a performance test is that it must demand genuinely *psycho-physical* activity throughout, i.e. the continuous interplay of both receptor and effector

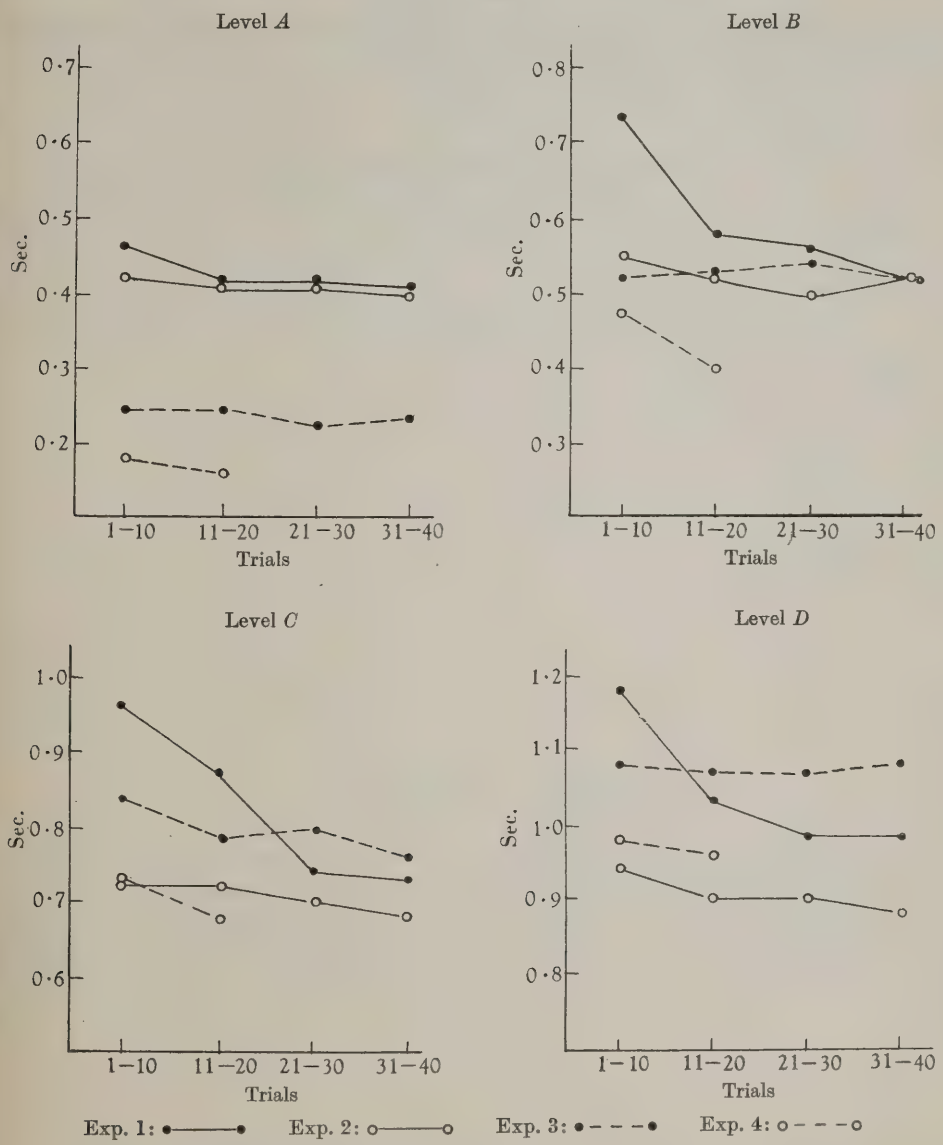

Fig. 4. Improvement curves (all subjects) in all four experiments, level by level.

processes; or, in more psychological terms, continuous conscious guidance of bodily action.

The converse of this conclusion is that given a reliable performance test, the individual differences it reveals (whatever the function or ability may be called) are stable *mental* and not physiological differences. The operative words in the conclusion are "continuous

interplay", i.e. *integration*. Neurologically, most human beings are alike, but they differ among themselves in respect of the control or integrating power they have over their neurological mechanisms.

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(*Manuscript received* 23 *February* 1947)

TWELFTH INTERNATIONAL CONGRESS OF PSYCHOLOGY

JULY 1948

The Twelfth International Congress of Psychology (postponed from 1940) will be held in EDINBURGH, Scotland, from 23 July to 29 July 1948.

The Congress fee will be £3 sterling for Members, who will receive a volume of *Proceedings*, and £1. 10*s*. sterling for Associates.

Accommodation can be arranged either in hostels or hotels. Intending members are requested to communicate as early as possible with the General Secretary.

James Drever
President

Godfrey Thomson
General Secretary
Moray House
Edinburgh, 8

EDITOR'S NOTICE

The Editor greatly regrets that through an oversight the name of Professor Pear was omitted from the List of Officers of the British Psychological Society published in Appendix I to the paper, "The British Psychological Society," by Beatrice Edgell, in the *British Journal of Psychology*, xxxvii, Part 3, p. 131. Professor T. H. Pear was President of the British Psychological Society from December 1942 to December 1943.

PUBLICATIONS RECENTLY RECEIVED

Retinal Structure and Colour Vision. A Restatement and an Hypothesis. By E. N. Willmer. Cambridge University Press. 1946. Pp. xii + 231. 21*s*.

Understanding of retinal processes is at present unmistakably on the move, and on a number of fronts. Granit, Polyak and Wald, with their associates, in the respective fields of electrophysiology, histology and biochemistry, have made it clear that retinal function is an affair far more complex than classical theories suggested. The understanding of these complexities must be the first aim—simplification will undoubtedly reassert itself later. In this state of flux, bold, speculative hypotheses such as that developed by Dr Willmer cannot be other than welcome. If his theory seem to some readers at first sight intolerably radical, they may console themselves with the reflexion that the final truth would probably appear equally so if juxtaposed with other present notions.

Very briefly, the view Dr Willmer advocates, and of which he examines the consequences in some detail, is that many of the phenomena of colour vision are compatible with the hypothesis that the three independent mechanisms involved are the cones, 'dark-adapting' rods, and 'non-dark-adapting' rods. He develops his argument by first considering the combination of the classical sensitivity *v.* wave-length curves of the cone- and rod-mechanisms. If, at each wave-length, rod-sensitivity (expressed as a fraction of its maximum) is plotted against cone-sensitivity, then a closed curve will be obtained, each point on which will represent the relative stimulation of rods and cones by a particular monochromatic light. With certain adjustments which can be made on a plausible basis, the shape of this curve resembles that of the spectral line on the C.I.E. chart. Further, by super-imposing appropriate hues on the curve, filling in the spaces between each horizontal pair of hues with an intermediate series obtained by colour mixture, and extending each horizontal series in a regular fashion outside the curve, a colour chart is obtained representing a large range of spectral and extra-spectral hues. This resembles, to a satisfactory degree, the empirically constructed C.I.E. chart, yet reveals discrepancies which require the intervention of a third mechanism to correct. The postulate of a type of rod which does not accumulate visual purple is developed in the later chapters for this purpose. The author points out that foveal cones in man have a rod-like form, and suggests that the fovea in fact contains a mixture of cones and non-dark-adapting rods, an arrangement which, on his theory, would afford dichromatic vision in the fovea. This conclusion tallies, of course, with the original claim made by König in 1894 that the normal human fovea is tritanopic, a claim which recent work by Willmer and Wright has done much to substantiate.

No short review can do justice to the painstaking ingenuity with which Dr Willmer has welded together the most diverse data into a quite fresh approach to a set of old problems. If future developments show that in some directions he has been somewhat too painstaking in his adjustments and conversions, he has a rich harvest of conclusions to justify him. To the psychologist probably the most interesting of his results will be those concerned with the relationship of hue to intensity, and with the position of white and black. His theory, for instance, suggests a plausible explanation, on a quantitative basis, for the Bezold-Brücke effect. And, perhaps most interesting of all, is the possibility—implied in what he says on pp. 113 and 104, though not explicitly developed—of an explanation of the phenomena of 'colour-constancy' in purely retinal terms. For it is a consequence of a theory which utilizes the rods as one colour mechanism, that the hue produced by any given local stimulation of the retina will be a function of the amount of adaptation produced by stimulation over the rest of the visual field.

A fascinating book closes with some consideration of colour-defect and colour-blindness in terms of the hypothesis put forward. R.C.O.

On the Contribution of Clinical Study to the Physiology of the Cerebral Motor Cortex. By F. M. R. Walshe. The Victor Horsley Memorial Lecture. Edinburgh: E. and S. Livingstone Ltd. 1947. Pp. 30. 1*s*. 6*d*. net.

In this admirable lecture, Dr Walshe evaluates and contrasts the respective contributions of experimental and clinical study to our understanding of the motor cortex. The experimentalist, he points out, has been prone to accept without question the punctate or 'cortical mosaic' theory of localization despite the weight of evidence against it. The clinician, on the other hand, relying on nature to make the experiments, has long recognized that such a theory is wholly incompatible with the facts of observation. Representation of movements, as Hughlings Jackson long ago recognized, is multiple in the sense that a given

cortical focus must contain the substrate of more than a single movement and that representations of the movements of a given part of the body overlap extensively. The fragmentary movements elicited by electrical stimulation of isolated cortical points do not provide a true guide to the nature of integrated cortical activity.

Although it would be difficult to quarrel with the central argument of this lecture, it might be objected that Dr Walshe does insufficient justice to the positive contributions of experimental neurophysiology. The delimitation by the stimulation technique of discrete cortical foci at least serves to define the areas of maximal cortical representation of individual movements and the recent investigations of facilitation and suppression by Dusser de Barenne and others may well come to clarify important clinical problems, notably epilepsy. It is difficult, too, to avoid the suspicion that the 'clinical' hypothesis of cerebral motor activity has advanced little since its formulation by Hughlings Jackson and can, at this stage, claim little originality. To the psychologist, at least, a new interpretation of the 'higher' motor functions in the light of neurological principles would prove of far greater value than a mere restatement, however able, of the classical Jacksonian doctrine. Thus a detailed study of the apraxias and kindred defects of high-grade motor co-ordination in the light of Hughlings Jackson's ideas might appreciably advance our understanding of motor integration. It is earnestly to be hoped that the clinical neurologist will soon see fit to illuminate this difficult field with the Jacksonian searchlight. In the meantime, however, the psychologist can feel nothing but admiration for Dr Walshe's brilliant review of cerebral motor function and nothing but gratitude for his brave, penetrating and timely vindication of clinical science in the neurological field.

O.L.Z.

Shakespeare's Imagination. By Edward A. Armstrong. London: Lindsay Drummond Ltd. 1946. Pp. 191. 10*s.* 6*d.* net.

One method of seeking an understanding of creative imagination is to study in detail the works of one great poet or artist; and to study in particular the imaginative detail which goes to construct these works. Dr Armstrong is an ornithologist, and he has begun his search by examining the bird imagery of Shakespeare, and the 'clusters' of images and ideas characteristically centred about particular birds and animals. Thus the kite is associated with carrion and death, hence with death-beds and bed-linen; also with offal, food and feasting. Similar ideas centre about the eagle, the drone, the beetle, the goose, the painted jay, and so on. Dr Armstrong then goes on to discuss the manner in which these 'image clusters' originated in Shakespeare's mind, partly from memories of actual experiences—such as seeing the kites feeding on carrion in the London streets—but still more by the emotionally charged reconstruction of the material at subconscious levels. Truly imaginative construction, however, differs from phantasy, which, though proceeding from the same levels, is dominated by wish fulfilment. As Coleridge says, "Imagination is put in action by the will and understanding, and retained under their irremissive, though gentle and unnoticed control"; and is detached from the particular emotional and personal experiences of the poet. Thus in the Freudian theory, based so largely on pathological material, the crude instinctive contents of the unconscious mind undergo a moral censorship at the preconscious level before they can enter the conscious mind. But in creative activity the selective action of the preconscious levels upon the products and psychic energy of the unconscious mind is enormously facilitated by conscious voluntary intellectual activity.

Psychologists will read with interest Dr Armstrong's discussion of this most difficult problem of creative activity; and must be beholden to him for the light which he has thrown upon it.

Psychology in Human affairs. By J. Stanley Gray. New York and London: McGraw-Hill Publishing Co. Ltd. Pp. viii + 646. 19*s.*

This encyclopaedic volume, intended for psychological beginners, contains a large amount of factual information, and a number of useful references, relating to various branches of applied psychology: child psychology, educational psychology and vocational guidance and selection; industrial psychology, work and business; psychology of advertising, public opinion, propaganda; military psychology; psychology of mental abnormality and crime; mental hygiene and clinical practice. This information is presented somewhat higgledy-piggledy, without explanatory theory, and without much critical evaluation except for some rather arbitrary judgements. But it might be quite a useful source book read in connexion with a course of elementary psychological lectures.

Criminal Justice and Social Reconstruction. By Herman Mannheim. London: Kegan Paul, Trench, Trubner and Co. Ltd. 1946. Pp. x+290. 15*s.* net.

It was an admirable idea to examine the incompatibility of much of the criminal law of this country with present-day attitudes to social justice. Dr Mannheim picks out some of the main anachronisms in the laws dealing with homicide, suicide and euthanasia; sterilization, birth control and abortion; sexual offences; theft and fraud of various kinds; and strikes and absenteeism. But his suggestions as to the reform of these laws and of their administration provide a blue-print for discussion and consideration, rather than an indication of what is immediately practicable. Although he mentions the point in his introduction, he seems not to bear sufficiently in mind that law in a democratic country must be determined as much by what the public will accept and on the whole obey, as by what accords with ideals of abstract justice. The difficulty, on which Dr Mannheim does not comment, is to find a means of determining what the actual reaction of the people would be to such reformed legislation, as apart from their verbally expressed opinions. In other words, would such legislation have a deterrent effect on crime, or one similar to that produced by the famous Eighteenth Amendment?

Dr Mannheim suggests that an increase of administrative and delegated legislation would overcome many of the shortcomings and inconsistencies of the present penal code. But if this necessitated a still greater increase of bureaucratic control, the result might be a revolt showing itself either in what is technically called crime, or in some other form of anti-social activity. Clearly it is a matter of extreme difficulty to forecast what the effects would be; and thus the reform of criminal justice must necessarily be a very slow process, lagging some distance behind current tenets of social justice—and even further behind the tenets of the most intelligent and enlightened members of the community.

German Youth: Bond or Free. By Howard Becker. London: Kegan Paul, Trench, Trubner and Co. Ltd. 1946. Pp. xiii+286. 18*s.* net.

It is unfortunate that a book as potentially interesting and valuable as this should fall between the two stools of documentation and dramatization. It would be most useful to have a detailed factual account of the rise of the German *Wandervögel*, the confused movements which followed the 1914–18 war, their eclipse by the Hitler Youth, and the attempted revolt of the Edelweiss movement. Reports of the actual opinions about these organizations voiced by individual Germans before 1939, and still more since 1945, would provide psychologial and sociological material of the greatest value. But Professor Becker has endeavoured to drive home his lesson by imaginative dramatization of the events and opinions. He states that "the reader can therefore be reasonably certain that in spite of the form of presentation no liberties have been taken with essential truth—*at least, truth as I then saw it and, with minor qualifications, as I still see it*" (italics mine). This is no way of giving reliable evidence. A straightforward presentation of the facts and an attempt to reach some rational conclusion from them would have made it easier to obtain some understanding of the fundamental psychological basis of the German youth movements, and the appeal which they had. Hence some conclusion might have been drawn as to the kind of treatment which might foster a healthier type of youth movement. The Epilogue to the book indicates that nothing could be worse than the present chaos of the Control Commission's regulations, and the lack of encouragement given to any liberal movement in Germany. The reader has been afforded little chance of gaining an understanding of the psychological basis for improvement.

The Application of the Rorschach Test to Young Children. By Mary Ford. University of Minnesota Press (Oxford University Press). 1946. Pp. 104. 12*s.* net.

Although much has been published about the Rorschach test as applied to adults and adolescents, the literature regarding its use with young children is comparatively scanty, and to this Dr Ford's book makes a welcome addition. She presents a careful analysis of the responses given by 123 children of ages between 3 and 8 years with whom she had wisely established previously a friendly relationship, so making the test situation easier. Another aid to good co-operation was probably the high intelligence of the children, whose average I.Q. was 124·35—not a typical sample of the population, as the author recognizes. In administering the test Dr Ford made a deviation from the standard Rorschach procedure by restricting the use of each card to the upright position, so decreasing markedly the normal range of perceptual stimuli—a simplification which she found necessary with very young children, but which makes comparison difficult between her results and those of other investigators.

To many Rorschach workers it may seem a pity that the modern Research Exchange scoring has been ignored in favour of the less differentiated original, though to the latter there is added a new category described as OL., 'Organizational Link', which seems to deserve further investigation as a factor in estimating the intellectual development of young subjects. Interesting tables are given of determinants compared with age, sex, and intelligence quotients, and an appendix contains three sample records scored by the author. In the study of these 123 tests there is perhaps too much stress laid upon the points value of isolated determinants and too little upon the interrelation of components and the general personality structure. It is, however, clear that Dr Ford combines a scientific approach with an excellent contact with small children, and it may be hoped that this book will prove to be a trial trip before her fuller exploration of this field of enquiry. T.A.

Modern Attitudes in Psychiatry. The March of Medicine, 1945. Number x of the New York Academy of Medicine Lectures to the Laity. New York: Columbia University Press (Oxford University Press). 1946. 13*s.* 6*d.* net.

This is an excellent series of lectures for the audience for which the lectures were designed. The historical background and future trends of psychiatry are discussed; and insight is given into the ways in which the psychiatrists solved their particular problems in the war. Two lectures which deal more specifically with general medical practice will be of much interest to those with little or no knowledge of psychiatry.

Our Inner Conflicts: A Constructive Theory of the Neuroses. By KAREN HORNEY. London: Kegan Paul, Trench, Trubner and Co. Ltd. 1947. Pp. 250. 10*s.* 6*d.* net.

This book consists of a most interesting and valuable development of the theory put forward by Dr Horney in her previous books, *The Neurotic Personality of Our Time* and *New Ways in Psychoanalysis*. Profoundly dissatisfied with the Freudian theory of the instinctual basis of neurosis, she postulates as the fundamental constituent a series of conflicts arising from the individual's reaction to a *basic anxiety*—that of the child feeling isolated and helpless in a potentially hostile world. To this situation he may react by moving towards people, trying to win their affection and approval; or by moving against them, by fighting their potential hostility; or by moving away from them, by isolation and independence. There must inevitably be some conflict between these three tendencies. But the normal individual achieves a reconciliation, alternating harmoniously between them from time to time according to circumstances. The neurotic, on the other hand, tries to suppress the conflict by raising one tendency to rigid, inflexible and compulsive predominance over the others. In particular, the third tendency may be exaggerated as a moving away from the conflict in neurotic detachment from other people. Or he may try to move away from himself, by creating in his mind an idealized image, significant, superior and harmonious, since he cannot tolerate the realization of his weakness and disintegration. A further attempt to breach the rift between idealized image and reality may then result in externalization—the projection of the conflict upon other people and the outside world, so that it is dissociated from the inner self.

The innumerable shifts in the operation of these tendencies are most ably discussed, together with their further outcome in fears, impoverishment of the personality, hopelessness and sadistic behaviour. A final chapter describes the treatment and resolution of the conflict; and it is a measure of the interest aroused that considerable frustration is created by the failure of the printer to print eleven of its pages! But the psychologist as well as the psychiatrist will learn much from this valuable and constructive effort to clarify the understanding of the mental processes of the neurotic.

Deep Analysis. By CHARLES BERG. London: George Allen and Unwin, Ltd. 1946. Pp. 261. 12*s.* 6*d.* net.

The whole of this book is devoted to the record of the psychoanalysis of a single case, that of a young man of considerable gifts and promise who nevertheless feels that life in general and women in particular have no interest for him. The analysis takes a satisfactory course through father and mother fixation, positive and negative transference, and at the end we are assured that he marries happily and attains his hitherto unfulfilled promise. A practical demonstration is thus given of the working of the Freudian theory, and of its therapeutic value, at least in this case.

If there are Pits as Deep. By Leo Liberthson. With illustrations by Rahngild. New York: The Diction Press. 1946. Pp. 125. $ 3.00.

This book consists of poems grouped under the following heads: If there are pits as deep; And deeper still; The edges and the brinks; The analyst speaks; How dull the barbs; Be thou that; Portraits; "O world, I cannot hold thee close enough"; A sonnet sequence for a calendar. It would be out of place for a reviewer in this *Journal* to assess the literary merit of these verses. As the titles indicate, the earlier poems are intended to demonstrate the mental processes of the mentally disordered, and of those bordering on neurosis or psychosis; and they are interesting as showing the possibility of conveying the emotional conditions obtaining in these states more vividly than can be done by sober prose—but whether more accurately is somewhat doubtful.

A Preface to Logic. By Morris R. Cohen. London: Routledge. 1946. Pp. ix + 212. 8*s.* 6*d.*

This book comprises a series of excursions (pedestrian for the most part) into fields bordering on the strict preserves of formal logic. Subjects such as the logic of fiction, probability, and the statistical view of Nature are dealt with, but the author's attack seems to lack single-mindedness. The book concludes with essays on F. H. Bradley and John Dewey which are informed with a real flavour of personal appreciation.

PROCEEDINGS OF THE BRITISH PSYCHOLOGICAL SOCIETY, 1946

GENERAL MEETINGS

February 9, 1946. GENERAL MEETING IN LONDON.

April 11–16, 1946. ANNUAL GENERAL MEETING AT DURHAM.

April 11.

1st Session. Bussiness Meeting of the Society and Annual General Meeting of the Social Psychology Section.

April 12.

2nd Session:

Symposium on "Psychological Principles in the Upbringing of Children, and their Interpretation to Parents". By C. W. VALENTINE and other speakers.

3rd Session:

"Psychological Aspects of Rehabilitation in Cases of Brain Injury." By O. L. ZANGWILL.

"Observations on the Reintegration of Personality after Prefrontal Leucotomy." By STEPHEN KRAUSS.

4th Session:

"Projection as a Psychological Concept and Method of Inquiry." By J. C. RAVEN.

"Probing the Personality of Children by Some Projective Techniques." By D. SAALFELD.

"Performance Testing in its Application to Personality Assessment." By B. SEMEONOFF.

April 13.

5th Session:

Symposium on "The Role of Techniques of Social Science."

(*a*) "Social Responsibility of the Scientists." By MADELINE KERR.

(*b*) "The Dynamics of Social Research." By E. L. TRIST.

(*c*) "The Frame of Reference of Social Workers." By ELLIOTT JAQUES.

6th Session:

"An Experiment on the Appreciation of Pictures." By R. W. PICKFORD.

"The Place of Psychology in Teacher Training." By GEORGE SETH.

7th Session:

Election of Officers and Council, followed by Presidential Address:

"Factorial Analysis—Recent Advances and a Retrospect." By GODFREY THOMSON.

8th Session:

Film: Personnel Selection in the British Army 1944—Officers.

April 14.

9th Session:

Symposium on "Psychological Aspects of War".

(*a*) "Crucial Requirements and Defects in Human Organization." By RANYARD WEST.

(*b*) "Statistical Facts Relevant to Keeping the Peace, and their Psychological Interpretation." By LEWIS F. RICHARDSON.

(*c*) "Psychologists and War—a Problem in Social Psychology." By T. H. PEAR.

10th Session:

"Lessons from Military Psychology." By J. G. W. DAVIES.

Discussion opened by Alec Rodger and J. Cohen.

"The Early History of the British Psychological Society." By BEATRICE EDGELL.

11th Session:

"Movement Study, an Historical Survey." By MAY SMITH.

"Movement Study Applied to Military Problems—a Demonstration of Films." By B. UNGERSON.

12th Session:
"Relations between Clairvoyance, Telepathy and Precognition." By R. H. Thouless.
"Expression by Graphic Lines." By R. W. M. Krauss.

13th Session:
"Assessment for Foremanship." By Nancy Timpany.
"The Educational Background of the Present Government and House of Commons." By Nancy E. Robertson and J. A. Waites.

14th Session:
"Design and Analysis of Some Psychological Experiments." By W. D. Seymour and W. L. Stevens.
"The Theory and Practice of Communication." By Frederick Laws.

15th Session
Open Session for Discussion.

May 18, 1946. General Meeting in London.
"The Study of Propaganda." By Otto Friedmann.
"Topic Analysis." By G. Patrick Meredith.

October 10, 1946. General Meeting in London.
"Freud's Great Illusion." By W. E. Sargent.

November 16, 1946. General Meeting in London.
Papers opening a Discussion on "The Uses and Abuses of Psychology in present-day Society." By J. C. Flugel, T. H. Pear and Alec Rodger.

December 12, 1946. General Meeting in London.
"The Spiritual Journey of Emanuel Swedenborg: a Study of Hallucinations." By E. J. Dingwall.

SECTIONAL MEETINGS

Medical Section

January 23, 1946. "Quo Vadimus?" By E. B. Strauss.

February 27, 1946. "Lessons for Child Psychiatry from Psychiatric Work with Evacuee Children." Papers by W. Clifford Scott, D. W. Winnicott and A. T. Alcock.

March 27, 1946. Joint Meeting with Industrial and Social Psychology Sections. "Problems of Re-settlement." Papers by Gertrude Williams, D. J. Clarkson, Elliott Jaques and A. T. M. Wilson.

May 29, 1946. "Some Aspects of German Culture and Character." By H. V. Dicks.

October 23, 1946. "Experiences in Creating 'a Community' for Hospital Patients." By T. M. Ling, J. Bierer and T. F. Main.

November 27, 1946. "Some Reasons for Personal Prejudice against the so-called Physical Therapy of Mental Disorder." By D. W. Winnicott.

December 18, 1946. Annual General Meeting.
Discussion on "The Implications of the National Health Service Bill for all Professional Workers in the Field of Mental Health." Opened by A. T. M. Wilson, M. I. Dunsdon and L. A. Shaw.

Education Section

January 4, 1946. "Psychology in the Training of Teachers." By F. J. Schonell.

March 16, 1946. "Children's Humour." By J. M. Williams.

June 22, 1946. Annual General Meeting of Education Section.
Joint Meeting with the Committee of Professional Psychologists (Mental Health).
"The Psychologist and the New Education Act." By A. H. Bowley.

November 1, 1946. "The Psychologist's Contribution to Educational Progress." By Philip R. Morris.

INDUSTRIAL SECTION

January 15, 1946. "Aspects of Prisoner-of-War Experience." By J. MUNRO FRASER.

March 12, 1946. ANNUAL GENERAL MEETING.
"Relations between the Industrial Psychologist and the Industrial Community." By WINIFRED RAPHAEL.

March 27, 1946. Joint meeting with Medical and Social Psychology Sections.

May 14, 1946. Film Lecture: "The Training of Interviewers." By J. HOWIE MITCHELL.

July 2, 1946. "The Validity of Selection Methods used in the Army and the Navy." By P. E. VERNON.

October 1, 1946. "Social Psychiatry and Industry." By J. D. SUTHERLAND.

November 5, 1946. "The Measurement of Temperament." By HILDE HIMMELWEIT.

December 3, 1946. "Field Research in Flying Training." By C. B. FRISBY.

SOCIAL PSYCHOLOGY SECTION

March 27, 1946. Joint meeting with Medical and Industrial Sections.

April 11, 1946. ANNUAL GENERAL MEETING AT DURHAM.

September 20–22, 1946. Week-end Conference in London on "Present Day Problems of Peace and War." Papers by A. W. WOLTERS, JOHN RICKMAN, T. H. PEAR, L. F. RICHARDSON, H. V. DICKS and E. JAQUES.

November 19, 1946. "Attitude and Opinion Measurement. A Critical Survey." By H. J. EYSENCK.

BRANCH MEETINGS

SCOTTISH BRANCH

February 2, 1946. (Edinburgh.)
"Bilingual Children in Lewis." By CHRISTINA A. SMITH.
"Factorial Analysis Applied to Colour Vision." By R. W. PICKFORD.

March 2, 1946. (Glasgow.)
"The Cinema: its Technique and its Value in Education." By G. H. BELL.
"The Special School in Scottish Education." By L. R. BOWYER.

May 4, 1946. (Glasgow.)
"Glasgow Corporation Child Guidance System." By THOMAS SMITH.
"Treatment in Nerston." By C. M. MCCALLUM.

October 26, 1946. (Edinburgh.)
"Validation of Selection Methods in the Army and Navy." By P. E. VERNON.
"The Growth and Development of War Office Selection Boards." By ARTHUR O. HEARD.

November 30, 1946. (Glasgow.)
"Speech Therapy as a Mental Health Service." By ANNE H. MCALLISTER.
"The Measurement and Prediction of Teaching Ability." By G. G. NEILL WRIGHT.

MIDLAND BRANCH

February 11, 1946. (Birmingham.)
ANNUAL GENERAL MEETING.
"Some Problems of the Co-ordination of Tendencies and the Building of Character." By C. W. VALENTINE.

June 1, 1946. (Leicester.)
"The Role of the Educational Psychologist under the New Education Act." By A. H. BOWLEY.

NORTHERN BRANCH

June 1, 1946. (Manchester.)
"The Adolescent in the Factory." By CORA TENEN.
"The Social Background of the Present House of Commons." By NANCY E. ROBERTSON and J. A. WAITES.
"Art and Psychology." By DORIS LINDSAY.

June 22, 1947. (Leeds.)
"Mechanism: A Study in Comparisons." By H. N. BOTTOMLEY.
"What is Psychological Talent?" By T. H. PEAR.
"Persistence in the Grammar School Entrant." By A. WEATHERILL.